

KONGU ENGINEERING COLLEGE, PERUNDURAI, ERODE - 638 052
(Autonomous)

B.Sc. DEGREE IN COMPUTER SYSTEMS & DESIGN (3 YEARS)
CURRICULUM

(For the candidates admitted from academic year 2014-15 onwards)

SEMESTER – I

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14BCT11	Communicative English I	3	0	0	3	40	60	100
14BCT12	Applied Mathematics I	3	1	0	4	40	60	100
14BCT13	Digital Principles	3	1	0	4	40	60	100
14BCT14	Fundamentals of Computing	3	0	0	3	40	60	100
14BCC11	Problem Solving and Programming	3	0	3	4	40	60	100
14VEC11	Value Education	0	2	1	1	100	0	100
	PRACTICAL							
14BCL11	Digital Laboratory	0	0	3	1	100	0	100
14BCL12	Office Automation Laboratory	0	0	3	1	100	0	100
14BCL13	Communication Skills and Career Development Laboratory I	0	0	3	1	100	0	100
Total					22			

CA – Continuous Assessment, ESE – End Semester Examination

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SEMESTER – II

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14BCT21	Communicative English II	3	0	0	3	40	60	100
14BCT22	Applied Mathematics II	3	1	0	4	40	60	100
14BCT23	Object Oriented Programming using C++	3	0	0	3	40	60	100
14BCT24	Basics of Electrical and Electronics Engineering	3	0	0	3	40	60	100
14BCT25	Data Structures	3	0	0	3	40	60	100
	PRACTICAL							
14BCL21	Object Oriented Programming Laboratory	0	0	3	1	100	0	100
14BCL22	Electrical and Electronics Engineering Laboratory	0	0	3	1	100	0	100
14BCL23	Data Structures Laboratory	0	0	3	1	100	0	100
Total					19			

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SEMESTER – III

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14BCT31	Operating Systems	3	1	0	4	40	60	100
14BCT32	Computer Architecture	3	1	0	4	40	60	100
14BCT33	Database Management Systems	3	1	0	4	40	60	100
14BCT34	Design and Analysis of Algorithms	3	1	0	4	40	60	100
	Elective - I (Open)	3	0	0	3	40	60	100
	PRACTICAL							
14BCL31	Operating Systems Laboratory	0	0	2	1	100	0	100
14BCL32	Database Management Systems Laboratory	0	0	2	1	100	0	100
14BCL33	Communication Skills and Career Development Laboratory II	0	0	2	1	100	0	100
Total					22			

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SEMESTER – IV

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14BCT41	Java Programming	3	0	0	3	40	60	100
14BCT42	Computer Networks	3	1	0	4	40	60	100
14BCT43	Software Engineering	3	0	0	3	40	60	100
14BCT44	Client Server Computing	3	0	0	3	40	60	100
	Elective – II (Professional)	3	0	0	3	40	60	100
	PRACTICAL							
14BCL41	Java Programming Laboratory	0	0	2	1	100	0	100
14BCL42	Networks Laboratory	0	0	2	1	100	0	100
14BCL43	Software Engineering Laboratory	0	0	2	1	100	0	100
Total					19			

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SEMESTER – V

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14BCT51	Visual Programming	3	0	0	3	40	60	100
14BCT52	Web Technology	3	1	0	4	40	60	100
14BCT53	Distributed Computing	3	0	0	3	40	60	100
14BCC51	Microprocessors	3	0	3	4	40	60	100
	Elective – III (Open)	3	0	0	3	40	60	100
	PRACTICAL							
14BCL51	Visual Programming Laboratory	0	0	2	1	100	0	100
14BCL52	Web Programming Laboratory	0	0	2	1	100	0	100
14BCP51	Mini Project	0	0	4	2	50	50	100
Total					21			

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CURRICULUM

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SEMESTER – VI

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
	Elective - IV (Professional)	3	0	0	3	40	60	100
	Elective - V (Professional)	3	0	0	3	40	60	100
	Elective - VI (Professional)	3	0	0	3	40	60	100
	PRACTICAL							
14BCP61	Project Work	0	0	18	9	100	100	200
Total					18			

CA – Continuous Assessment, ESE – End Semester Examination

Total Credits: 121

LIST OF PROFESSIONAL ELECTIVES					
Course Code	Course Title	Hours/Week			Credit
		L	T	P	
SEMESTER IV					
14BCE01	Operations Research	3	0	0	3
14BCE02	Principles of Management	3	0	0	3
14BCE03	Linux Operating System	3	0	0	3
14BCE04	Computer Graphics	3	0	0	3
14BCE05	Compiler Design	3	0	0	3
SEMESTER VI					
14BCE06	E-commerce	3	0	0	3
14BCE07	Cloud Computing	3	0	0	3
14BCE08	Software Project Management	3	0	0	3
14BCE09	Grid Computing	3	0	0	3
14BCE10	Wireless Networks	3	0	0	3
14BCE11	Information Security	3	0	0	3
14BCE12	Network Management	3	0	0	3
14BCE13	Middleware Technologies	3	0	0	3
14BCE14	Extreme Programming	3	0	0	3

LIST OF OPEN ELECTIVES					
Course Code	Course Title	Hours/Week			Credit
		L	T	P	
SEMESTER III					
14BCO01	.NET Programming	3	0	0	3
14BCO02	Environmental Studies	3	0	0	3
SEMESTER V					
14BCO03	Component Based Technology	3	0	0	3
14BCO04	Network Security	3	0	0	3

14BCT11 COMMUNICATIVE ENGLISH I

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I

9

Grammar & Vocabulary: Affixes and roots – Prefixes (de, dis, il, im, in, ir, mis, un) and Suffixes (-ful, -ness, -ly, -less, -able, -ing, -er, -est)- Synonyms & Antonyms, Homophones, Homonyms; **Writing:** Introduction to Technical Writing- using Abbreviations, Acronyms, and Single line Definition - Technical terms; Comprehension passage-I (Multiple choice). **Verbal Activities** (NOT FOR EXAMINATION): **Listening** : Types of listening; **Reading:** Skimming; **Speaking:** Storytelling.

UNIT – II

9

Grammar & Vocabulary: Word formation and Derivation – Single-word Substitute – Noun, Verb, Adjective, Adverb; **Writing:** Letter writing – Informal letter writing; Comprehension passage-II (Question and Answer). **Verbal Activities** (NOT FOR EXAMINATION): **Listening** – Process of listening; **Reading:** Scanning; **Speaking:** Role Play.

UNIT – III

9

Grammar & Vocabulary: Sentence formation - Tenses- Present - Indefinite/ Continuous / Perfect ; **Writing:** Letter Writing - Personal letter; Comprehension passage-III (Complete the sentence). **Verbal Activities** (NOT FOR EXAMINATION): **Listening:** Implications of effective listening; **Reading:** Identifying main idea; **Speaking:** Making oral Presentation – Different kinds of Presentation – Planning a presentation.

UNIT – IV

9

Grammar & Vocabulary: Sentence formation - Tenses- Past - Indefinite/ Continuous / Perfect, Future - Indefinite/ Continuous / Perfect – Definitions; **Writing:** Writing & Sending Email Messages; Comprehension passage-IV (True or False, Match the Synonyms and Antonyms). **Verbal Activities** (NOT FOR EXAMINATION): **Listening:** Gap filling activity while listening; **Reading:** Summarizing; **Speaking** - Making oral Presentation – Adapting a speaker’s ideas to audience – planning the use of visual and other devices to involve audience.

UNIT – V

9

Grammar & Vocabulary: Sentence Formation - Subject-verb agreement, Jumbled words, Error correction; **Writing:** Writing Instructions; Comprehension passage-V (Reasoning or Moral Questions). **Verbal Activities** (NOT FOR EXAMINATION): **Listening:** Listening to a discourse & filling up gaps in a worksheet; **Reading:** paraphrasing; **Speaking:** Group Discussion.

TOTAL: 45

TEXT BOOKS:

1. “Learn English – A Fun Book Of Functional Language, Grammar And Vocabulary”, McGraw Hill Education [India] Pvt. Ltd, Santana Sinha Chaudhuri 2013.

REFERENCE BOOKS:

1. Aruna Koneru, “Professional Communication”, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2009.
2. Andrea J. Rutherford, “Basic Communication Skills for Technology”, Second Edition, Pearson Education, 2006.

Course Outcomes:

On completion of the course the students will be able to

- improve the grammar and vocabulary for use in different contexts
- get familiarized with different methods of listening skills
- speak effectively in English in various situations and acquire reading skills
- gain knowledge about writing skills
- enrich reading habit to acquire good vocabulary skill

14BCT12 APPLIED MATHEMATICS I

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

UNIT – I 9

Matrices: Characteristic Equation of a matrix – Eigen values and Eigen vectors of real matrix – Properties of eigen values and eigen vectors(statement only) – Cayley Hamilton theorem (statement only) – Similarity transformation(concept only) -Orthogonal matrices – orthogonal transformation of symmetric matrix to diagonal form – Quadratic forms - Reduction of Quadratic form to Canonical form by Orthogonal reduction.

UNIT – II 9

Ordinary Differential Equations: Linear differential equations of second order with constant coefficients when the R.H.S is e^{ax} , x^n , $n>0$, $\sin(ax)$, $\cos(ax)$, $e^{ax} x^n$, $e^{ax} \sin(bx)$, $e^{ax} \cos(bx)$. Differential equations with Variable coefficients (Euler's type only).

UNIT – III 9

Theory of Equations: Relationships between roots and coefficient - Equations with real coefficients and imaginary roots- Symmetric function of the roots- Formation of equations whose roots are given—To diminish the roots of an equation by h – Multiple roots – Reciprocal equation- Simple problems only.

UNIT – IV 9

Vector Differential Calculus: Scalar and vector point functions- vector operator, gradient, Directional derivative, Divergence and curl of vectors – Irrotational and solenoidal vectors. -Simple problems only.

UNIT – V 9

Vector Integral Calculus: Line Integral(concept only) – Surface Integrals(concept only) and Volume Integrals (concept only) – Verification of Gauss Divergence theorem (without proof) – cubes and rectangular parallelepiped –Verification of Green's theorem (without proof) – circle and ellipse – Verification of Stoke's theorem (without proof) -Square, rectangle – Simple problems

Lecture:45, Tutorial:15, TOTAL: 60

TEXT BOOKS:

1. Kandasamy. P, Thilagavathy. K and Gunavathy. K, "Engineering Mathematics For First Year B.E/B.Tech", Reprint Edition 2014, S.Chand and Co., New Delhi.
2. Kandasamy. P, Thilagavathy. K and Gunavathy. K, "Numerical Methods", Reprint Edition 2014, S.Chand and Co., New Delhi.

REFERENCE BOOKS:

1. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, New Delhi, 2011.
2. Veerarajan. T., "Engineering Mathematics, (for first year), Reprint Edition 2013, Tata McGraw-Hill New Delhi.
3. Jain R.K and Iyengar S.R.K, "Advanced Engineering Mathematics", Narosa Publishing House, New Delhi, Reprint 2014.
4. Dr.V.N.Vedamurthy, Dr. N. Ch.S.N. Iyengar,"Numerical Methods" Reprint 1999, Vikas Publishing House Pvt.Ltd.
5. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 2011.

Course Outcomes:

On completion of the course the students will be able to

- find the eigen values and eigen vectors
- solve the linear differential equations of second order
- identify the roots of given equations
- solve problems involving tangent planes and normal lines
- have a clear idea about line , surface and volume integrals

14BCT13 DIGITAL PRINCIPLES

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

UNIT – I 9

Binary Systems and Logic Gates: Digital systems- Binary Numbers- Number Base Conversions- Octal Numbers- Hexa Decimal Numbers- Complements-Signed Binary numbers- Binary codes- Binary storage and registers- Binary Logic-Digital Logic Gates

UNIT – II 9

Minimization and Boolean Algebra: Basic theorems and properties of Boolean Algebra- Boolean functions- Canonical and Standard Forms-Minimization: POS, SOP- K-Map Method: 2-variable, 3-variable, 4-variable- Don't care conditions- NAND and NOR Implementation.

UNIT – III 9

Combinational Logic: Combinational circuits- Analysis Procedure-Design Procedure - Binary Adder-Subtractor- Half Adder, Full Adder, Half Subtractor, Full Subtractor, -Decimal Adder- Binary multiplier- Magnitude comparator-Decoders- Encoders- Multiplexers-Demultiplexer.

UNIT – IV 9

Synchronous Sequential Logic: Sequential circuits- Latches- SR, D latches - Flip-Flops- D Flip-Flop, JK Flip-Flop, T Flip-Flop, characteristic table, characteristic equation -Analysis of clocked sequential circuits: Analysis of D flip-flops, Analysis of JK Flip-Flops, Analysis of T Flip-Flops.

UNIT – V 9

Registers and Counters: Registers- Shift Registers- Ripple counters-Binary Ripple counters, BCD Ripple counters- Synchronous counters- Binary, BCD counter- Ring counters-Johnson counter.

Lecture:45, Tutorial:15, TOTAL: 60

TEXT BOOKS:

1. Mano, M Morris and Ciletti D.Michael, "Digital Design", 4th Edition, Pearson Education, Delhi, 2012.

REFERENCE BOOKS:

1. Floyd Thomas L., "Digital Fundamentals", 10th Edition, Pearson Education, Delhi, 2012.
2. Yarbrough, John M., "Digital Logic: Applications and Design", Cengage Learning, Delhi, 9th Indian Reprint 2012.
3. Givone, Donald D., "Digital Principles and Design", Tata McGraw-Hill, Delhi, 22nd Reprint 2012.

Course Outcomes:

On completion of the course the students will be able to

- understand the basic principles of logic gates
- familiar with boolean algebra and theorems
- design and analyze circuits using flip flops
- devise various synchronous and asynchronous circuits
- identify and work with different counters

14BCT14 FUNDAMENTALS OF COMPUTING

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I

9

Basics of Computer: Introduction – Digital and Analog Computers – Characteristics – History – Generations – Classification – Computer System – Applications – Computer System Hardware: Introduction – Central Processing Unit – Memory – Instruction – Microprocessor – Interconnection – Performance – Inside a Computer Cabinet.

UNIT – II

9

Memory and I/O Devices: Computer Memory :Introduction - Representation – Hierarchy – CPU Registers – Cache Memory – Primary and Secondary Memory – Access types – Magnetic storage – Optical storage – Using memory – Input and Output Devices: Data Entry Devices – Output Devices – I/O Port – Working of I/O system.

UNIT – III

9

Types of Software: User Computer Interface: Interaction – Types of Software – System Software – Application Software – Software Acquisition – Operating System: Introduction – Objectives – Types – Functions – Process Management – Memory Management – File Management – Device Management – Protection and Security – User Interface – Examples.

UNIT – IV

9

Computer Programming and Network Fundamentals: Computer Programming Fundamentals: Introduction – Program Development Life Cycle – Programming Paradigms – Data Communication and Computer Network: Introduction – Importance – Data Transmission Media and Data Networking – Computer Network – Wireless Networking.

UNIT – V

9

Fundamentals of Internet Services and Security: The Internet and Internet Services: Introduction – History – Internetworking – Architecture – Managing Internet Connections – Internet Address – Services – Uses – Information Systems – Computer Security: Threats and Attacks – Malicious Software – Hacking – Security Services and Mechanisms.

TOTAL: 45

TEXT BOOKS:

1. Anita Goel, “Computer Fundamentals”, Pearson Education India, 2010.

REFERENCE BOOKS:

1. Balagurusamy. E, “Fundamentals of Computers” , Tata McGraw-Hill Ltd, New Delhi, 2009.
2. Rajaraman, “Fundamentals of Computers”, 4th Edition, PHI Learning, 2008.
3. Leon Alexis, and Leon Mathews, “Introduction to Information Systems” Vijay Nicole Imprints Private Limited, First Edition, 2008.

Course Outcomes:

On completion of the course the students will be able to

- identify computer peripherals and its functionalities
- explore the various memory and I/O devices in CPU
- familiar with different types of software used in computer
- recognize the functions of operating system and other system softwares
- understand the basic network principles

14BCC11 PROBLEM SOLVING AND PROGRAMMING

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 3 4

UNIT – I 9

Introduction to Computer and Problem Solving: Overview of computers – Applications of computers-Characteristics of computer - Basic computer Organization – Number System - Problem solving: Planning the computer program – Algorithms - Flowcharts – Pseudo codes –Structuring the logic – Top-Down design.

UNIT – II 9

Case Study on Problem Solving: Algorithm, Flowchart and Pseudo code for the problems: Exchanging the values of two variables – Finding the biggest number - Counting – Summation of numbers – Factorial computation – Generation of Fibonacci Sequence - Summation of series – Base Conversion - Reversing the digits of an Integer.

UNIT – III 9

Introduction to C and Control Statements: Overview of C – Basic structure of a C Program – Executing a C Program – C Character set – Tokens – Keywords and Identifiers – Constants – Variables – Data types - Storage classes - Managing Input and output operations – Operators and Expressions - Decision making and branching - looping – break and continue statements.

UNIT – IV 9

Arrays, Strings and Functions : Arrays – One dimensional and Two dimensional arrays - Handling of character Strings: Declaring and initializing string variables – String handling functions - Library functions – User defined functions :Elements of User defined Functions – nesting of functions – passing arrays to function – passing string to functions - recursion.

UNIT – V 9

Structures, Unions and Pointers: Structure definition – Structure declaration – Accessing a structure member- Structure initialization – Array of Structures - Arrays within structures –Structures within Structures – Structures and Functions, Unions. Understanding pointers – Accessing address of a variable – declaring pointer variables – initialization of pointer variables – accessing a variable through its pointer – Pass by value vs. Pass by pointers

Lecture:45, Practical:45, TOTAL: 90

REFERENCE BOOKS:

1. R.G.Dromey, “How to Solve it by Computer”, Pearson Education , 2009.
2. E.Balagurusamy, “Fundamentals of computing and programming”, Tata McGraw-Hill Education Pvt. Ltd, 2010.
3. Stephen G Kochan, “Programming in C” Third Edition, Pearson Education, 2005.
4. Yashavant P. Kanetkar. “ Let Us C”, BPB Publications, 2011.

Course Outcomes:

On completion of the course the students will be able to

- apply fundamental principles of problem solving techniques
- develop algorithm, flowchart and pseudo code to provide solutions to problems
- develop programs using basic programming principles of C language
- implement modular programming concepts using functions
- design simple applications using arrays, structures and pointers

UNIT – I**6**

Philosophy of Life Science: Life – Purpose of life (four stages of life)–Philosophy of life (who am 'I') – Law of nature (cause of the life and body) – Content of the Life (five sheaths) – Goal of life. Five duties in life. **Methodology:** Life and messages of spiritual and national leaders– The forgotten hero, etc. **Project report:** Complementing with happiness - Every soul is potentially divine

UNIT – II**6**

Human Values-Moral foundation: Truth, forgiveness, compassion, endurance, humility, non violence, moderate diet, non stealing, self purification, self discipline, self study, content, cleanliness, honesty, and totality in faith– Good habits – Attitude forming for Individual peace. **Practical Methods:** Personal experience with above characters, Puranic Stories - Self resolve diary maintenance

UNIT – III**6**

Social Values: Family – Family System - Greatness of women – World brotherhood (vasudeiva kudumbagam) – Glorious Bharath - Bharathian systems - Past –Present – Future - Team spirit - Goal setting – Economics – Education – Politics – Responsibilities of people – Preserving natural resources. **Methodology:** Preparing an album on glorious Bharath Past, Present and Future Plans. Goal setting - Management Games. Team Spirit - Yogic Games.

UNIT – IV**6**

Development of Mental Prosperity: Prosperity of mind – Functions of mind - Obstacles of mind - Practical method to perfect mind is yoga – Types – Uses – Precaution – Contradiction – Kriyas - Asanas – Pranayamas – Meditative techniques. **Methodology:** Asana - Pranayama – Cyclic meditation – Nada anu sandhana – Meditation – Yogic games for memory. Album on asanas , pranayama and mantra.

UNIT – V**6**

Maintenance of Physical Health: Human body – Structure - Ten Systems of the body as per modern science. Five elements - Harmonious relationship – Life force – Conserving vitality & health through natural life – Pranic food and its importance – Uses of herbs - Right way of cooking to preserve nutrients - Cause of the disease – Acute and chronic - Disease - Life and death. **Methodology:** Natural food making, traditional millet dishes. Asanas, pranayamas, cleansing procedures. Quiz on healthy living, Uses of herbs or kitchen garden.

TOTAL : 30**TEXT BOOK:**

1. “Value Education”, compiled by Vethathiri Maharishi Institute for Spiritual and Intuitional Education, Aliyar, Pollachi, for Kongu Engineering College

Course Outcomes:

On completion of the course the students will be able to

- understand the purpose and value of life
- exhibit positive human values
- understand social values
- take steps to develop mental and physical health

14BCL11 DIGITAL LABORATORY

(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 3 1

LIST OF EXPERIMENTS:

1. Verification of AND, OR, NOT, NAND, NOR, XOR Logic Gates
2. Code Converters
3. Parity Generator
4. Half Adder / Full Adder
5. Half Subtractor / Full Subtractor
6. Encoder / Decoder
7. Multiplexer / Demultiplexers
8. Binary and BCD counter
9. Up / Down 4 bit Binary Counter
10. Shift Register
11. Ring counter

TOTAL: 45

REFERENCES / MANUALS / SOFTWARE:

1. Digital Trainer Kit
2. Integrated Circuits

Course Outcomes:

On completion of the course the students will be able to

- analyze logic gates
- demonstrate code converters and parity generators
- design combinational and sequential logic circuits
- implement electronic circuits for registers and counters

14BCL12 OFFICE AUTOMATION LABORATORY

(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 3 1

LIST OF EXPERIMENTS:

MS-WORD

1. Design student grade sheet & leave letter using following options in ms word. Page setup, font type, color, style, size, heading, bold, under line, text highlight color, line space, indents, alignment, tables.
2. Design a newspaper in ms word using following options. Insert- columns ,header, footer, Date, Time, Page break, borders, page numbers, water marks, pictures, charts, hyperlink, bookmark, textboxes, drop caps, cover page options.
3. Create a mail merge for sending a letter to different Recipients.
4. Design an invitation using macros and clip art.

MS-EXCEL

5. Create a consolidate attendance report for a class in ms excel using following options Math functions(Sum, average, count ,max ,min, count if, pivot), increase decimal, decrease decimal, merge cells, wrap text, borders, cell alignment, bold , font style, type colors, background colors, insert rows and columns, delete rows and columns , row height and column width.
6. Get external data from access and create chart for it
7. Solve mathematical problems using text functions, logical functions, mathematical and trigonometrical functions, date and time functions
8. Design an application using sorting and filtering data, freeze panes and view gridlines.

MS-POWER POINT

9. Create a presentation with different layouts and designs and use the following options. Page setup, slide orientation, background styles, colors, fonts, effects, Chart, text box, header, footer, word art, date, time, slide number, object, sound, clip art, pictures, custom animation and slide show.

TOTAL: 45

REFERENCES / MANUALS / SOFTWARE:

1. Office Suite

Course Outcomes:

On completion of the course the students will be able to

- create and edit word documents
- use wizard for mail merge and macros
- build excel worksheets and carry out calculations using built in functions
- prepare power point slide presentations using various features

14BCL13 COMMUNICATION SKILLS AND CAREER DEVELOPMENT LABORATORY I
(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 3 1

LIST OF EXPERIMENTS:

1. Listening:
Listening to grammar exercises.
Listening to famous speeches.
2. Speaking:
Introduction on speech mechanism.
Speaking on general topics.
Presenting an abstract.
3. Reading:
Vocabulary drilling.
Reading newspaper.
4. Writing:
Dialogue writing
Letter writing.
Circular writing.
Paragraph writing.

TOTAL: 45

REFERENCES / MANUALS / SOFTWARE:

1. Globarena

Course Outcomes:

On completion of the course the students will be able to

- enhance students communication skills
- enrich their vocabulary
- develop creative writing skills

14BCT21 COMMUNICATIVE ENGLISH II

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I 9

Grammar & Vocabulary: Use of Pronouns/ Prepositions/ Conjunctions- Infinitives and Gerunds. Writing: Writing descriptions: places, people, buildings, events; Comprehension passage-I (Question and Answer & Multiple choice). **Verbal Activities** (NOT FOR EXAMINATION): Listening : Listening to Conversations; Speed Reading: Reading short stories; Speaking: Informal presentation.

UNIT – II 9

Grammar & Vocabulary: Voice- Active/ Passive / Impersonal Passive; Writing: Report writing, Note making. **Verbal Activities** (NOT FOR EXAMINATION): Listening : Listening to Presentations; Speed Reading: Reading Passages (general); Speaking: Formal presentation.

UNIT – III 9

Grammar & Vocabulary: Four Types of Sentences- Declarative- Interrogative- Imperative- Exclamatory; Writing: Essay writing; Comprehension passage-III (Complete the sentence). **Verbal Activities** (NOT FOR EXAMINATION): Listening : Listening to Announcements; Speed Reading: Reading News clips; Speaking: Participating in Interviews.

UNIT – IV 9

Grammar & Vocabulary: Simple Sentences- Complex Sentences- Compound Sentences [If clause]; Writing: Transcoding: Transferring information from passages to charts and tables – converting information from charts and tables to passages; Comprehension passage-IV (True or False, Match the Synonyms and Antonyms). **Verbal Activities** (NOT FOR EXAMINATION): Listening : Listening to Instructions; Speed Reading: Reading technical passages; Speaking: Oral Presentation – General/Technical.

UNIT – V 9

Grammar & Vocabulary: 1.Punctuation 2. Spotting errors; Writing: Formal letter writing – Job application letter; Comprehension passage-V (Reasoning or Moral Questions). **Verbal Activities** (NOT FOR EXAMINATION): Listening : Listening to TV News; Speed Reading: Reading Tongue twisters; Speaking: Group Discussion.

TOTAL: 45

TEXT BOOKS:

1. Learn English – A Fun Book Of Functional Language, Grammar And Vocabulary. McGraw Hill Education [India] Pvt. Ltd, Santana Sinha Chaudhuri 2013.

REFERENCE BOOKS:

1. Sangeeta Sharma and Mishra Binod,- Communication Skills for Engineers and Scientists, PHI Learning Pvt. Ltd., New Delhi. 2011.
2. Leena Sen,- Communication Skills, Prentice Hall of India Pvt. Ltd., 2009.

Course Outcomes:

On completion of the course the students will be able to

- improve their grammar and vocabulary for use in different contexts
- get familiarized with different methods of listening skills
- adapt different methods of reading
- speak effectively in English in various situations
- acquire knowledge about various academic and technical writing skills

14BCT22 APPLIED MATHEMATICS-II

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

UNIT – I 9

Statistical Measures: Summarizations of uni and multi dimensional data – frequency distribution - Measures of central tendency: mean, median, mode. Measures of dispersion: range, quartile deviation, mean deviation, standard deviation - simple problems.

UNIT – II 9

Curve Fitting: Evaluation of constants by the method of group averages(To fit a straight line) – Equations involving three constants of the form $y = a + bx + cx^2$, $y = ax^b + c$, $y = ab^x + c$ and $y = ae^{bx} + c$ by the method of group averages – Fitting a straight line by the method of least squares- Fitting a parabola by the method of least squares – Fitting an exponential curve by the method of least squares. Method of moments(To fit a straight line and parabola).

UNIT – III 9

Correlation and Linear Regression: Karl Pearson’s coefficient of correlation-Spearman’s rank correlation — regression coefficients – Estimation of two Regression lines -simple problems

UNIT – IV 9

Sampling: Introduction to sampling distributions – Types of sampling- Standard Error –Test of Significance- - Test of significance for large samples-Test of significance for single proportion- Testing of significance for difference of proportions-Test of significance for single mean- Test of significance for difference of means of two large samples.

UNIT – V 9

Testing of Hypothesis: t-test - t-test of significance for single mean - t-test for difference of means of small samples. F-test of significance-chi-square distribution- chi-square test of goodness of fit- Independence of attributes.

Lecture:45, Tutorial:15, TOTAL: 60

TEXT BOOKS:

1. S.P.Gupta., “Statistical Methods”, Sultan Chand & Sons, New Delhi, 41st Edition, 2011.
2. Kandasamy P, Thilagavathy K and Gunavathy K., “Probability Statistics and Queuing Theory”, S.Chand, 2006.

REFERENCE BOOKS:

1. Gupta.S.P, “Practical Statistics”, S.Chand & Company Ltd., New Delhi, Reprint 2010.
2. Kandasamy P., Thilagavathy K. and Gunavathy K., “Numerical Methods”, Reprint Edition 2014, S.Chand and Co., New Delhi.
3. Babu Ram , “Engineering Mathematics”, Pearson 2010.
4. Ramana B.V., “Higher Engineering Mathematics”, Tata McGraw Hill Publishing Company, New Delhi, 2011.

Course Outcomes:

On completion of the course the students will be able to

- find mean, median, mode and measures of dispersion
- obtain the curve fitting
- identify when correlation and regression analysis are appropriate
- know about the types of sampling and errors
- analyze the testing of hypothesis and formulate null and alternative hypotheses

14BCT23 OBJECT ORIENTED PROGRAMMING USING C++

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I 9

Introduction and C++ Functions: Object Oriented Programming paradigm –Basic Concepts – Benefits of OOP – Beginning with C++ – Structure of C++ program –Tokens, Expressions and Control Structures. : Main Function –Function prototyping –Call by reference –Return by reference – Inline functions – Function overloading.

UNIT – II 9

Classes & Objects, Arrays: Classes and objects -Specifying a class –Defining Member functions - Making an outside function inline –Nesting of member functions –Private member functions. Arrays within a class–Memory allocation for objects –Static data members and member functions –Arrays of objects –Friendly functions –Pointers to members.

UNIT – III 9

Constructors, Operator Overloading And Conversions: Constructors and destructors: Constructors –parameterized constructors –Multiple Constructors –Copy constructor –Dynamic constructors –Destructors –Operator Overloading and type conversions : Rules for overloading operators - Overloading unary operators –Overloading binary Operators –Overloading binary operators using friends –Manipulation of strings using operators –Type conversions.

UNIT – IV 9

Inheritance and Polymorphism: Inheritance: Single inheritance –Making a private member inheritable –Multilevel inheritance –Multiple inheritance –Hierarchical inheritance –Hybrid inheritance. Virtual base classes –Abstract classes –Constructors in derived class –Pointers-Pointers to objects –this pointer –Pointers to derived classes –Virtual functions –Pure virtual functions.

UNIT – V 9

Files and Exception Handling: Working with files: Classes for file stream operations –Opening and closing a file –Detecting end-of-file –File modes –File pointers and their manipulations –Sequential input and output operations –Error handling during file operations –Command line arguments- Exception handling.

TOTAL: 45

TEXT BOOKS:

1. Balagurusamy E., “Object Oriented Programming with C++”, 6th Edition, Tata Mc Graw Hill Education Private Limited, New Delhi, 2013.

REFERENCE BOOKS:

1. Herbert Schildt, “C++ The Complete Reference”, 4th Edition, Mc-Graw Hill Companies, United States of America, 2003.
2. Kamthane, A., “Object Oriented Programming with ANSI and Turbo C++”, Pearson Education, Delhi, 2006.
3. Deitel and Deitel, “C++ How to Program”, 6th Edition, PHI Press, 2009.

Course Outcomes:

On completion of the course the students will be able to

- know the difference between object oriented programming and procedural programming
- develop the C++ program with control structures, arrays, classes and objects
- manipulate object oriented programming concepts using simple programs
- familiar with inheritance and polymorphism to write applications
- handle exceptions and files

14BCT24 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I **9**

Fundamentals of DC Circuits: Basic concepts of electric field, Electric Current, Electric Potential, Potential Difference, Electric Work, Electric Power & Electric Energy. Basic Circuit Elements: R, L, C. Ohm's law, Kirchhoff's law: Kirchhoff's Current Law, Kirchhoff's Voltage Law. Resistance in Series, Resistance in parallel, Mesh Analysis for resistive network having independent source only–Simple Problems.

UNIT – II **9**

Fundamentals of AC Circuits: Generation of Sinusoidal alternating Voltage and Current: Equation, Waveform, Cycle, Time period and Frequency, RMS and Average value, Form factor, Peak factor – Simple Problems. Wiring Diagram for Fluorescent Lamp, Staircase wiring.

UNIT – III **9**

Fundamentals of Electronics Circuits: Basics concept of Conductors, Insulators, Semiconductors. Construction, Characteristics and Applications: PN Junction diode, Zener diode, Bipolar Junction Transistor, Silicon Control Rectifier.

UNIT – IV **9**

Converters: [Excluding problems]: Working principles of Half wave rectifier and Full wave rectifier –Centre tap and Bridge rectifier –Working Operation of SMPS,UPS(block diagram only)

UNIT – V **9**

Electrical Machines: [Excluding problems]: Faradays laws, Lenz's law, Self and Mutual Induction Principle, Construction, Types, Principle of Operation and Applications of: DC Generator, DC Motor, Single Phase Transformer.

TOTAL: 45

TEXT BOOKS:

1. P.V.Prasad, S.Sivanagaraju, R. Prasad, “Basic Electrical and Electronics Engineering”, Cengage Learning India Pvt. Ltd., 2013.

REFERENCE BOOKS:

1. Theraja B.L., “Fundamentals of Electrical Engineering and Electronics”, S.Chand & Co, New Delhi.
2. Metha V.K., Rohit Metha, “Principles of Electrical Engineering”, S.Chand & Company Ltd., New Delhi.
3. Sedha R.S., “Applied Electronics”, 1st Edition, S.Chand & Company Ltd., New Delhi, 2001.

Course Outcomes:

On completion of the course the students will be able to

- acquire the basic concepts of Electrical and Electronics Engineering
- understand the fundamentals of AC circuits
- get exposed to the basic principles of electrical machines for controlling applications
- know the working principles of converters
- familiar with electrical machines

14BCT25 DATA STRUCTURES

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I 9

Arrays and Stacks: Linear Data Structures and their sequential storage representation: concepts and terminology – Storage structure for arrays – Structures and arrays of structures- Stacks – Application: Recursion, Conversion of Infix to Postfix

UNIT – II 9

Queues and Linked Lists: Queues – Operations – Circular Queue – Priority Queue –Application : Simulation - Pointers and Linked Allocation – Linked Linear Lists : Operations , Doubly Linked Linear Lists – Application: Polynomial Manipulation.

UNIT – III 9

Trees: Definitions and Concepts – Operation on Binary Trees- Binary tree Traversals - Storage Representation and Manipulation of Binary Trees: Linked Storage – Threaded Storage - Application of Binary Tree: Manipulation of Arithmetic Expression.

UNIT – IV 9

Graphs: Graphs and their representation – Matrix representation of graph – Graph Traversal Techniques: Breadth first search – Depth first search – Spanning trees – Application: Program Evaluation and Review Technique (PERT).

UNIT – V 9

Sorting and Searching: Sorting – Notation and Concepts – Selection Sort – Bubble Sort – Quick Sort – Heap Sort – Radix Sort – Searching Techniques: Sequential Search and Binary Search.

TOTAL: 45

TEXT BOOKS:

1. Tremblay J.P. and Sorensen P.G., “An Introduction to Data Structures with Applications”, 2nd Edition, Tata McGraw Hill, New Delhi, Reprint 2013.

REFERENCE BOOKS:

1. Brijendra Kumar Joshi,” Data Structures and Algorithms in C++” Tata McGraw-Hill, New Delhi, 2010.
2. Vijayalakshmi Pai G.A.,”Data Structures and Algorithms”, 2nd Edition, Tata McGraw-Hill, New Delhi, 2008.
3. Balagurusamy E., “Computer Programming and Data Structures”, 3rd Edition, Tata McGraw-Hill, New Delhi, 2012.

Course Outcomes:

On completion of the course the students will be able to

- recognize the storage structure of array and stack
- handle the operations of queue and linear list
- get familiarized with non linear data structure
- know the traversal techniques and applications of graph
- handle searching and sorting operations on various data structures

14BCL21 OBJECT ORIENTED PROGRAMMING LABORATORY
(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 3 1

LIST OF EXPERIMENTS:

1. Simple Programs in C++
2. Implementation of Call by Value, Call by Address and Call by Reference
3. Create a Complex Number Class with all possible Operators
4. Implementation of Classes and Objects
5. Constructors and destructors
6. Operator Overloading and Function Overloading
7. Implementation of Inheritance
8. Implementation of Virtual Base Class
9. Implementation of Polymorphism
10. File Handling

TOTAL: 45

REFERENCES / MANUALS/ SOFTWARES:

1. Lab Manual

Course Outcomes:

On completion of the course the students will be able to

- write programs using the syntactic features of C++
- develop programs that exploits the modularity of object-oriented programs
- solve real-time problems using the C++

LIST OF EXPERIMENTS:

1. Verification of Ohm's Law.
2. Verification of Kirchoff's Law.
3. Measurement of Current, Voltage and Power for simple DC circuits.
4. VI characteristics of PN junction diode.
5. VI characteristics of Zener diode.
6. Voltage Regulator using Zener diode.
7. Open circuit & Load Test on D.C. Shunt Generator
8. Single phase Power Measurement Using Voltmeter and Ammeter.
9. Load Test on Single Phase Transformer
10. Load Test on single Phase induction Motor
11. Load Test on three Phase induction Motor
12. Study of SMPS
13. Study of Half Wave and Full Wave Rectifiers

TOTAL: 45

REFERENCES / MANUALS/ SOFTWARES:

1. Lab Manual

Course Outcomes:

On completion of the course the students will be able to

- verify the various ohm's and Kirchoff's laws
- measure the current and voltage of DC circuits
- test the load on single phase and three phase induction motors

14BCL23 DATA STRUCTURES LABORATORY

(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 3 1

LIST OF EXPERIMENTS:

1. Array Operations
2. Stack Operations using Arrays
3. Applications of Stack – Infix to postfix
4. Queue Operations using Arrays
5. Circular Queue using Arrays
6. Singly linked list Operations
7. Selection sort
8. Quick sort
9. Heap sort
10. Sequential search & Binary search
11. Bubble sort
12. Binary Tree Traversal Techniques

TOTAL: 45

REFERENCES / MANUALS/ SOFTWARES:

1. Lab Manual

Course Outcomes:

On completion of the course the students will be able to

- implement algorithms for linear data structures
- write programs for non-linear data structures
- implement various searching and sorting operations

14BCT31 OPERATING SYSTEMS

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

Pre-requisites: Fundamentals of Computing

UNIT – I 9

Overview of Operating System and Process Concept: Role of Operating Systems – Computer System Organization—Computer System Architecture-Operating System Structure- Operating System Operations-Process Management-Memory Management-Storage Management - Protection and Security-Distributed System-Special Purpose Systems-Computing Environments- Process Concept – Process Scheduling –Operations on Processes –Interprocess Communication.

UNIT – II 9

Multithreading, Process Scheduling and Synchronization: Overview –Multithreading Models – Threading Issues –Process Basic Concept-Scheduling Criteria –Scheduling Algorithms-Thread Scheduling –Multiprocessor Scheduling –Background –The Critical Section Problem –Peterson’s Solution-Synchronization Hardware –Semaphores –Classic Problems of Synchronization -Monitor.

UNIT – III 9

Deadlock and Memory Management: System Model –Deadlock Characterization –Methods for Handling Deadlocks –Deadlock Prevention – Deadlock Avoidance – Deadlock Detection –Recovery from Deadlocks –Memory Management: Background –Swapping –Contiguous Memory Allocation – Paging –Structure of the Page Table-Segmentation.

UNIT – IV 9

Virtual Memory and File System: Background –Demand Paging –Copy on Write–Page Replacement –Allocation of Frames –Thrashing – File Concept –Access Methods –Directory and Disk Structure.

UNIT – V 9

File System Implementation and Secondary Storage Structure: File System Structure –File System Implementation –Directory Implementation –Allocation Methods –Free Space Management-Overview of Mass Storage Structure –Disk Structure –Disk Attachment-Disk Scheduling –Disk Management.

Lecture: 45, Tutorial: 15, TOTAL: 60

TEXT BOOKS:

1. Silberschatz Abraham., Galvin B Peter and Gagne Greg, “Operating System Concepts”, 8th Edition, Wiley India Pvt. Ltd., New Delhi, 2012.

REFERENCE BOOKS:

1. Andrew S. Tanenbaum, Albert S. Woodhull, “Operating Systems, Design and Implementation”, 8th Edition, Pearson Prentice Hall, 2009.
2. Deitel H.M.,”Operating Systems”, 3rd Edition, Pearson Education, Reprint 2009.
3. Stallings William, “Operating Systems: Internals and Design Principles”, 7th Edition, Prentice Hall of India, 2012.

Course Outcomes:

On completion of the course the students will be able to

- know the role of operating systems and its types
- apply the concept of a process, thread and scheduling in real time problems
- understand deadlock occurrence and methods to handle it
- identify the various memory management techniques and file system
- familiarize with various mass storage structures and disk management operations

14BCT32 COMPUTER ARCHITECTURE

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

Pre-requisites: Digital Principles

UNIT – I 9

Basic Structure and Machine Instructions: Computer Types- Functional Units- Operational Concepts- Bus Structures- Software- Performance- Multiprocessors and Multicomputers- Machine Instructions: Numbers, Arithmetic Operations and Characters- Memory Locations and Addresses- Memory Operations- Instructions and Instruction Sequencing- Addressing Modes.

UNIT – II 9

Arithmetic: Addition and Subtraction of Signed Numbers- Design of Fast Adders- Multiplication of Positive Numbers- Signed-Operand Multiplication- Fast Multiplication- Integer Division- Floating Point Numbers and Operations.

UNIT – III 9

Processing Unit and Pipelining: Fundamental Concepts- Execution of a Complete Instruction- Multiple Bus Organization- Hardwired Control- Microprogrammed Control - Pipelining: Basic Concepts- Data Hazards- Instruction Hazards.

UNIT – IV 9

Memory System: Basic Concepts- Semiconductor RAM Memories- Read-Only Memories- Speed, Size and Cost- Cache Memories- Performance Considerations- Virtual Memories- Memory Management Requirements- Secondary Storage.

UNIT – V 9

Input/Output Organization: Accessing I/O Devices- Interrupts- Direct Memory Access- Buses- Interface Circuits- Standard I/O Interfaces.

Lecture: 45, Tutorial: 15, TOTAL: 60

TEXT BOOKS:

1. Hamacher Carl, Vranesic Zvonko, Zaky Safwat, “Computer Organization”, 5th Edition, McGraw Hill Education, 2013.

REFERENCE BOOKS:

1. Stallings William, “Computer Organization and Architecture Designing for Performance”, 8th Edition, Pearson Education.
2. Rajaraman V. and Radhakrishnan T., “Computer Organization and Architecture”, Prentice Hall of India.
3. Godse A. P. and Godse D. A., “Computer Organisation”, 4th Edition, Technical Publications, Pune.

Course Outcomes:

On completion of the course the students will be able to

- understand the computer components and addressing modes
- acquire knowledge on machine instructions
- realize the pipelining concepts
- recognize the various arithmetic operations
- identify the different memory and I/O devices

14BCT33 DATABASE MANAGEMENT SYSTEMS

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

Pre-requisites: Basic Knowledge in Programming Languages and Data Structures

UNIT – I 9

Introduction and Database Design Model: Database System Applications – Purpose of Database Systems – View of Data – Database Languages – Relational Databases – Database Design – Data Storage and Querying – Transaction Management – Database Architecture – Data Mining and Information Retrieval – Specialty Databases – Database Users and Administrators – History of Database Systems – Database Design and the E-R Model.

UNIT – II 9

Structured Query Language: Overview of SQL Query Language – SQL Data Definition - Basic Structure of SQL Queries – Additional Basic Operations - Set Operations - Null Values - Aggregate Functions - Nested Sub Queries - Modification of the Database – Intermediate SQL – Functions and Procedures – Triggers.

UNIT – III 9

Relational Database Design: Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies – Functional Dependency Theory – Algorithms for Decomposition - Decomposition using Multivalued Dependencies – More Normal Forms – Database Design Process – Modeling Temporal Data.

UNIT – IV 9

Transactions: Transaction Concept – A Simple Transaction Model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability – Transaction Isolation and Atomicity – Transaction Isolation Levels – Implementation of Isolation Levels – Transactions as SQL Statements.

UNIT – V 9

Concurrency Control: Lock Based Protocols – Deadlock Handling – Multiple Granularity – Timestamp Based Protocols – Validation Based Protocols – Multiversion Schemes – Snapshot Isolation – Insert Operations, Delete Operations and Predicate Reads – Weak Levels of Consistency in Practice – Concurrency in Index Structure.

Lecture: 45, Tutorial: 15, TOTAL: 60

TEXT BOOKS:

1. Silberschatz Abraham., Korth Henry F. and Sudarshan S., “Database System Concepts”, 6th Edition, McGraw Hill, New York, 2011.

REFERENCE BOOKS:

1. Date C.J., Kannan A. and Swamynathan S., “An Introduction to Database Systems”, 8th Edition, Pearson Education, New Delhi, 2012.
2. Elmasri Remez, and Navathe Shamkant B., “Database Systems: Models, Languages, Design and Application Programming”, 6th Edition, Pearson Education, New Delhi, 2013.
3. Connolly Thomas and Begg Carolyn, “Database Systems : A Practical Approach to Design, Implementation and Management”, 4th Edition, Pearson Education, New Delhi, 2013.

Course Outcomes:

On completion of the course the students will be able to

- understand data modeling concepts and their applications
- develop, design and construct a typical enterprise database
- apply suitable techniques in designing a database
- familiar with database management issues
- realize the concurrency control in DBMS

Pre-requisites: Data Structures

UNIT – I

9

Introduction and Divide-and-Conquer: Introduction – Algorithm Specification – Performance Analysis – Divide and Conquer: General Method – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort.

UNIT – II

9

Greedy Method and Dynamic Programming: The Greedy Method – The General Method – Knapsack Problem – Tree Vertex Splitting – Minimum-Cost Spanning Trees – Prim’s Algorithm – Kruskal’s Algorithm – An Optimal Randomized Algorithm - Dynamic Programming: The General Method – Multistage Graphs – All Pairs Shortest Paths – Single Source Shortest Paths – Optimal Binary Search Trees - The Travelling Salesperson Problem.

UNIT – III

9

Basic Traversal and Search Techniques: Techniques for Binary Trees – Techniques for Graphs – Breadth First Search and Traversal – Depth First Search and Traversal - Connected Components and Spanning Trees – Biconnected Components and DFS.

UNIT – IV

9

Backtracking: The General Method – The 8 Queens Problem – Sum of Subsets – Graph Coloring – Hamiltonian Cycles – Knapsack Problem.

UNIT – V

9

Branch and Bound & NP-Hard and NP-Complete: The Method – Least Cost Search – The 15 Puzzle – Control Abstractions – Bounding – FIFO Branch and Bound – LC Branch and Bound – 0/1 Knapsack Problem – Travelling Salesperson Problem – NP Hard and NP Complete: Basic Concepts.

Lecture: 45, Tutorial: 15, TOTAL: 60

TEXT BOOKS:

1. Horowitz Ellis., Sahni Sartaj and Rajasekaran Sanguthevar, “Fundamentals of Computer Algorithms”, Galgotia Publications, New Delhi, 2009.

REFERENCE BOOKS:

1. Levitin Anany, “Introduction to the Design and Analysis of Algorithms”, 3rd Edition, Pearson Education, New Delhi, 2015.
2. Thomas H Cormen, Charles E Leiserson, Ronald L Rivest and Clifford Stein, “Introduction to Algorithms”, 3rd Edition, Prentice Hall of India, New Delhi, 2009.
3. Jean-Paul Tremblay, Paul G. Sorenson, “An Introduction to Data Structures with Applications”, 2nd Edition, Tata McGraw Hill Publishing Company, New Delhi, Reprint 2010.

Course Outcomes:

On completion of the course the students will be able to

- familiarize the different algorithm design techniques
- analyze the algorithm for space and time complexity
- recognize the computational complexity
- understand the different searching techniques
- identify the branch and bound methods for the real time problems

14BCL31 OPERATING SYSTEMS LABORATORY

(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 2 1

LIST OF EXPERIMENTS / EXERCISES:

1. Basic UNIX Commands
2. Shell Programming using control and conditional statements
3. Implementation of FCFS scheduling algorithms
4. Implementation of SJF scheduling algorithms
5. Implementation of FIFO page replacement algorithms
6. Implementation of LRU page replacement algorithms
7. Implementation of file operations
8. Implement inter process communication using pipes and message queues
9. Implement inter process communication using semaphores
10. Implement the process management system calls
11. Implement producer-consumer problem

TOTAL : 30

REFERENCES / MANUALS / SOFTWARE:

1. Linux Operating System
2. Borland C

Course Outcomes:

On completion of the course the students will be able to

- work with basic commands of UNIX
- implement the various CPU scheduling algorithms
- write programs based on multiple cooperating processes and synchronization algorithms

14BCL32 DATABASE MANAGEMENT SYSTEMS LABORATORY
(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 2 1

LIST OF EXPERIMENTS / EXERCISES:

1. Simple DDL and DML
2. Check / Key Constraints
3. Views
4. Sequences
5. Nested queries
6. Group by functions / having clause
7. PL/SQL functions
8. PL/SQL procedures
9. Triggers
10. Cursors
11. PL/SQL packages

CASE STUDY

Banking System, Inventory System, Student Information System, Library Management System.

TOTAL : 30

REFERENCES / MANUALS / SOFTWARE:

1. SQL
2. Oracle

Course Outcomes:

On completion of the course the students will be able to

- work with DDL and DML commands
- design and implement a database schema for a given problem
- write the queries , sequences, PL/SQL functions
- implement PL/SQL packages and triggers

14BCL33 COMMUNICATION SKILLS AND CAREER DEVELOPMENT LABORATORY II
(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 2 1

LIST OF EXPERIMENTS / EXERCISES:

1. Listening to software packages
 - (i) Concord
 - (ii) Verbal aptitude
2. Speaking
 - (i) Introducing oneself and answering FAQ's.
 - (ii) Making a presentation
 - (iii) Participating in group discussion
 - (iv) Introduction on soft skills
3. Reading
 - (i) Reading comprehension
 - (ii) Reading reviews on advanced technology
4. Writing
 - (i) Writing a job application letter with resume
 - (ii) Explaining a project
 - (iii) Answering tricky interview questions

TOTAL : 30

REFERENCES / MANUALS / SOFTWARE:

1. Young India Software
 - (a) Tense Buster Intermediate
 - (b) Tense Buster Advanced
 - (c) Issues in English
2. Video Files
 - (a) Videos for group discussion
 - (b) Videos for speaking

Course Outcomes:

On completion of the course the students will be able to

- make students familiar with the pronunciation styles of the native speakers of English.
- participate in communicative activities in formal contexts effectively.
- write effective reports and improve accuracy in the use of language.

14BCT41 JAVA PROGRAMMING

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

Pre-requisites: Object Oriented Programming

UNIT – I

9

Introduction: Java Evolution: Java History - Features – Comparison of Java with C and C++ - Java and Internet –Java and WWW-Web Browsers-Hardware and Software Requirements – Java Support Systems- Java Environment - Overview of Java Language: Simple Java Program - More of Java - Application with Two Classes - Java Program structure – Java Tokens –Java Statements- Installing and Configuring Java - Implementing a Java Program – Java Virtual Machine- Command Line arguments – Constants, Variables and Data Types - Operators and Expressions.

UNIT – II

9

Decision Making Statements, Classes, Objects and Methods: Decision Making and Branching - Decision Making and Looping - Classes, Objects and Methods: Introduction to Class - Defining a Class –Fields Declaration – Methods Declaration - Creating Objects –Accessing Class Members - Constructors – Method Overloading – Static Members – Nesting of Methods - Inheritance - Overriding methods - Final Variables and Methods - Final Classes – Finalizer Methods - Abstract Methods and Classes – Methods with Varargs - Visibility Control.

UNIT – III

9

Arrays, Strings and Vectors, Interfaces and Packages: One-dimensional Arrays-Creating an Array –Two Dimensional Arrays- Strings –Vectors – Wrapper Classes- Enumerated Types – Interfaces: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface variables – Packages: Java API Packages – Using System Packages- Naming Conventions - Creating Packages – Accessing and Using a Package – Adding a Class to a Package – Hiding Classes.

UNIT – IV

9

Multithreaded Programming, Managing Errors and Exceptions: Creating Threads-Extending the Thread Class –Stopping and Blocking a Thread- Life Cycle of a Thread – Using Thread Methods - Thread Exceptions – Thread Priority – Synchronization – Runnable Interface –Inter-thread communication – Managing Errors and Exceptions: Types of Errors - Exceptions – Syntax of Exception Handling Code - Multiple Catch Statements –Using Finally Statement - Throwing own Exceptions.

UNIT – V

9

Applet Programming and Graphics Programming: Introduction - Applets Vs Applications - Writing Applets - Building Applet Code - Applet Life Cycle – Creating an Executable Applet – Designing a Web Page –Applet Tag - Adding Applet to HTML File –Running the Applet – More About Applet Tag - Passing Parameters to Applets – Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses - Drawing Arcs – Drawing Polygons.

TOTAL: 45

TEXT BOOK:

1. Balagurusamy E., “Programming with Java A Primer”, Fifth Edition, McGraw Hill Education (India) Private Limited, New Delhi, 2015.

REFERENCE BOOKS:

1. Schildt Herbert, “Java: The Complete Reference”, 9th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2014.
2. Poornachandra Sarang,” Java Programming “, McGraw Hill Professional, 2012.
3. Savitch J. Walter and Mock Kenrick, ”Absolute Java”, 4th Edition, Pearson Education International, 2010.

Course Outcomes:

On completion of the course the students will be able to

- understand the basics of object oriented programming
- solve the real time problems using classes and objects
- apply the concepts of inheritance, interfaces and polymorphism
- handle system and user defined exceptions
- develop simple applets

14BCT42 COMPUTER NETWORKS

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

Pre-requisites: Fundamentals of Computing

UNIT – I 9

Foundation: Introduction to Computer Networks –Applications-Requirements-Network Architecture –Implementing Network Software–Performance.

UNIT – II 9

Direct Link and Wireless Networks: Perspectives on connecting-Encoding (NRZ,NRZI, Manchester, 4B/5B)-Framing-Error Detection-Reliable Transmission-Ethernet and Multiple Access Networks (802.3) –Wireless Networks(802.11/Wi-Fi,802.15.1,Cell Phone Technologies).

UNIT – III 9

Routing: Basics of Internetworking (IP)-Service Model-Global Addresses – Datagram Forwarding in IP-Subnetting and Classless Addressing-Address Translation(ARP)-Host Configuration (DHCP)-Error Reporting (ICMP)-Virtual Networks and Tunnels-Routing: Network as a Graph-Distance Vector (RIP)-Link State (OSPF)-Metrics.

UNIT – IV 9

UDP and TCP: Simple Demultiplexer (UDP)-Reliable Byte Stream (TCP): End-to-End Issues-Segment Format-Connection Establishment and Termination-Sliding Window Revisited-Trigging Transmission-Adaptive Retransmission-Record Boundaries-TCP Extensions-Performance-Alternative Design Choices-Remote Procedure Call: RPC Fundamentals-RPC Implementations.

UNIT – V 9

Applications: Traditional Applications: Electronic Mail (SMTP,MIME,IMAP) -World Wide Web (HTTP)-Web Services-Multimedia Applications: Session Control and Call Control-Resource Allocation for Multimedia Applications-Infrastructure Services: Name Service (DNS)-Network Management (SNMP).

Lecture:45, Tutorial:15, TOTAL: 60

TEXT BOOKS:

1. Davie Bruce S. and Peterson Larry L., “Computer Networks - A System Approach”, 5th Edition, Morgan Kaufmann, 2012, Elsevier Inc.

REFERENCE BOOKS:

1. Forouzan Behrouz A., “Data Communications and Networking”, 5th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2012.
2. Tanenbaum Andrew S., “Computer Networks”, 5th Edition, Pearson Education, 2014.
3. Godbole, Achyut S and Kahate Atul., “Data Communication and Networks”, 2nd Edition, Tata McGraw Hill Publishing Company, New Delhi, 2011.

Course Outcomes:

On completion of the course the students will be able to

- understand the components required to build different types of networks
- identify the functionalities of layered architecture
- trace the flow of information from one node to another
- familiarize with UDP and TCP based communications
- explore the real time applications of computer networks

14BCT43 SOFTWARE ENGINEERING

(Common to Computer Systems & Design and Information Systems)

3 0 0 3

Pre-requisites: Fundamentals of Computing

UNIT – I 9

Process Models and Understanding Requirements: A Generic Process Model- Process Assessment and Improvement – Prescriptive Process Models –Agility- Agility and Cost of Change – Agile Process – Extreme Programming -Understanding Requirements: Requirements Engineering- Establishing the Groundwork – Eliciting Requirements – Developing Use Cases – Building the Requirements Model-Negotiating Requirements – Validating Requirements.

UNIT – II 9

Estimation and Project Scheduling: Observations on Estimation- The Project Planning Process- Software Scope and Feasibility – Resources – Software Project Estimation – Decomposition Techniques – Empirical Estimation Models – Estimation for Object Oriented Projects – Specialised Estimation Techniques – The Make/Buy Decision – Project Scheduling.

UNIT – III 9

Requirements Modelling and Design Concepts: Requirements Analysis – Scenario Based Modelling – UML Models that Supplement the Use Case – Data Modelling Concepts – Class Based Modelling – Design Concepts: Design within the Context of Software Engineering – The Design Process – Design Concepts – The Design Model.

UNIT – IV 9

Software Testing Strategies: A Strategic Approach to Software Testing – Strategic Issues – Test Strategies for Convention Software – Test Strategies for Object Oriented Software – Test Strategies for WebApps - Validation Testing – System Testing – The Art of Debugging – Testing Conventional Applications: Software Testing Fundamentals – Internal and External Views of Testing – White Box Testing – Basis Path Testing – Control Structure Testing – Black Box Testing - Model Based Testing – Testing for Specialized Environments, Architectures and Applications – Patterns for Software Testing.

UNIT – V 9

Risk Management and SCM: Reactive versus Proactive Risk Strategies – Software Risks – Risk Identification –Risk Projection – Risk Refinement – Risk Mitigation, Monitoring and Management – The RMMM Plan – Software Configuration Management: SCM- The SCM Repository- The SCM Process – Configuration Management for WebApps.

TOTAL: 45

TEXT BOOK:

1. Pressman S. Roger, “Software Engineering: A Practioner's Approach”, 7th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2014.

REFERENCE BOOKS:

1. Sommerville Ian, "Software Engineering", 8th Edition, Pearson Education Asia, Singapore, 2009.
2. Jalote Pankaj, "An Integrated Approach to Software Engineering", 3rd Edition, Narosa Publishing House, New Delhi, 2005.
3. Ghezzi, et al, "Fundamentals of Software Engineering", 2nd Edition, Prentice Hall of India, New Delhi, 2009.

Course Outcomes:

On completion of the course the students will be able to

- understand the methods for designing projects
- estimate and schedule projects
- identify testing and monitoring strategies
- design a model for user requirements
- familiarize with risk and configuration management

Pre-requisites: Databases and Operating Systems

UNIT – I

9

Client/Server Computing and Operating Systems: The Client/Server Computing Era -Real Client/Server - Fat Servers or Fat Clients- 2-Tier Versus 3-Tier- Intergalactic Client/Server – Client/Server Building Blocks - Clients, Servers and Operating Systems: The Anatomy of a Server Program - Server Need From an OS - Server Scalability - Client Anatomy-Client Need From an OS – Client/Server Hybrids.

UNIT – II

9

Operating Systems Wars and Middleware: Client OS Trends – Client OS - Server OS Trends – Server OS-NOS: Creating the Single System Image - NOS Middleware - RPC, Messaging and Peer-to-Peer: Peer-to-Peer Communications- RPC - Messaging and Queuing- MOM Versus RPC.

UNIT – III

9

SQL Database Servers: The Fundamentals of SQL and Relational Databases –SQL Database Server Architecture –Stored Procedures, Triggers and Rules – Data Warehouses: OLTP Data – Information at Fingertips – The Data Warehouse – EIS/DSS : Query/Reporting Tools – OLAP and Multi-dimensional Data – Data Mining – Personal Information Agents.

UNIT – IV

9

Transactions and TP Monitor: The ACID Properties – Transaction Models - TP Monitors: Managing Client/Server Transactions - TP Monitors – Benefits - TP Lite or TP Heavy: The Origins of TP Lite - TP Lite Versus TP Heavy.

UNIT – V

9

Groupware and Internet: Client/Server Groupware - Importance - Groupware Comparison - The Components of Groupware - Web Client/Server The Interactive Era: 3-Tier Client/Server Web Style – HTML’s Web Based Forms - CGI: The Server Side of the Web – CGI and State.

TOTAL: 45

TEXT BOOKS:

1. Robert Orfali, Dan Harkey and Jeri Edwards, “Client/Server Survival Guide”, 3rd Edition, Wiley India Pvt. Ltd., 2009.

REFERENCE BOOKS:

1. Dawna Travis Dewire., “Client Server Computing”, McGraw Hill, 2008.
2. Yadav S.C., and Sanjay Kumar Singh, “An Introduction to Client/Server Computing”, 1st Edition, New Age International Publishers, New Delhi, 2009.
3. Eric J Janson, “The Complete Guide to Client/Server Computing”, Prentice Hall of India, 2001.

Course Outcomes:

On completion of the course the students will be able to

- understand the client server computing and operating systems
- realize the role of middleware
- familiarize with SQL database servers
- identify the ACID properties
- classify transaction models and TP monitors

14BCL41 JAVA PROGRAMMING LABORATORY

(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 2 1

LIST OF EXPERIMENTS / EXERCISES:

1. Classes and objects
2. Command line arguments
3. Constructors
4. Method overloading
5. Method overriding
6. Inheritance
7. Interfaces
8. Packages
9. Multithreading
10. Exception handling
11. Applets
12. Graphics programming

CASE STUDY

Determine Odd and Even Numbers - Sorting and Searching - Complex Number Manipulation - Area Calculation for Geometrical Shapes - Payroll Preparation - Mark List Preparation - Voters Eligibility - Banner Creation – Simple Arithmetic Calculations using Applets – Draw Circles and Arcs.

TOTAL : 30

REFERENCES / MANUALS / SOFTWARE:

1. Java

Course Outcomes:

On completion of the course the students will be able to

- design and implement object oriented programming concepts
- develop simple applets
- write graphical applications

14BCL42 NETWORKS LABORATORY

(Common to Computer Systems & Design, Information Systems and Software Systems)

0 0 2 1

LIST OF EXPERIMENTS / EXERCISES:

1. Write a java program to implement URL
2. Write a java program to implement echo
3. Write a java program to implement remote command execution
4. Write a java program to implement TCP/IP client sockets
5. Develop an application for transferring files over the port
6. Develop a client–server application for chat
7. Write a java program to implement remote method invocation
8. Write a java program to implement remote procedure call under client / server environment
9. Write a java program to illustrate java native interface
10. Write a java program to implement ARP/RARP
11. Write a java program using ping command to check the connectivity

TOTAL : 30

REFERENCES / MANUALS / SOFTWARE:

1. Windows-Operating System
2. Java

Course Outcomes:

On completion of the course the students will be able to

- design and implement socket programming
- implement client server programming in java
- check the connectivity between systems in a given network

LIST OF EXPERIMENTS / EXERCISES:

1. Familiarization of features of any one of the standard software engineering tool
2. Collect the requirement and prepare the SRS document
3. Schedule the project using Gant chart
4. Draw the use case, sequence, collaboration and the class diagram for designing the project
5. Implement using appropriate front end and back end
6. Test the project by writing test cases

TOTAL : 30**REFERENCES / MANUALS / SOFTWARE:**

1. Rationale Rose, Microsoft Visio 2005, Visual Basic, VB.Net, Java, PHP
2. Access, Oracle, SQL Server

Course Outcomes:

On completion of the course the students will be able to

- create SRS document for the project
- schedule and design projects
- perform unit and integration testing

14BCT51 VISUAL PROGRAMMING

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

Pre-requisites: Object Oriented Programming

UNIT – I

9

Introduction: Essential Visual Basic .Net: Visual Basic Integrated Development Environment – Visual Basic Language Operators: Visual Basic Statements - Declaring Constants - Declaring Variables - Data Types – Converting between Data Types - Declaring Arrays and Dynamic Arrays - Using Visual Basic Operators.

UNIT – II

9

Conditionals, Loops and Procedures: Visual Basic Language Conditionals and Loops: If...Else Statements - Select Case - Switch and Choose - Do Loop - For Loop - For Each...Next Loop - While Loop - With Statement – Handling Higher Math - Date and Time - Financial Data – Visual Basic Language Procedures: Creating Sub Procedures - Creating Functions - Passing a Variable Number of Arguments - Creating Properties – Windows Forms: Using the MsgBox Function – InputBox Function.

UNIT – III

9

Exception Handling, Menus and Dialog Boxes: Visual Basic Language Exception Handling: Using Unstructured Exception Handling - Using Structured Exception Handling - Using Multiple Catch Statements – Using Finally - Throwing an Exception – Windows Forms Menus Dialog Boxes: Menu Items – Context menus-Open File Dialogs – Save File Dialogs - Font Dialogs - Color Dialogs - Print Dialogs - Print Preview Dialogs - Page Setup Dialogs-Immediate Solutions.

UNIT – IV

9

Files and Data Access with ADO.NET: Graphics and File Handling: Using the FileStream Class – FileMode Enumeration - FileAccess Enumeration - FileShare Enumeration – StreamReader Class - StreamWriter Class – BinaryReader Class – BinaryWriter Class - File Class – Directory Class –Data Access: Databases Definition - Accessing Data with the Server Explorer - Data Adaptors and Datasets - Working with ADO .Net - Overview of ADO .Net Objects-Immediate Solutions.

UNIT – V

9

Handling Database: OleDbConnection Class - SqlConnection Class – OracleConnection Class-OleDbCommand Class - SqlCommand Class – OracleCommand Class-OleDbDataAdapter Class - SqlDataAdapter Class – DataSet Class-OleDbDataReader Class - SqlDataReader Class-DataTable Class-DataRow Class-DataColumn Class-DataRelation Class-Immediate Solutions

TOTAL: 45

TEXT BOOKS:

1. Holzner Steven, “Visual Basic .NET Programming Black Book”, Dreamtech Press, New Delhi, 2014.

REFERENCE BOOKS:

1. Chavan Shirish, “Visual Basic .Net”, Pearson Education, 2009.
2. Vick Paul, “The Visual Basic .NET Programming Language”, Pearson Education, 2004.
3. Bill Sheldon, Billy Hollis, Rob Windsor, David McCarter, Gaston Hillar C. and Todd Herman, “Professional Visual Basic 2012 and .NET 4.5 Programming”, John Wiley & Sons, 2012.

Course Outcomes:

On completion of the course the students will be able to

- explore the .Net framework
- create and apply procedures, sub-procedures and functions for effective code
- implement object oriented programming concepts in visual basic programs
- use different file functions in visual basic .Net
- develop projects using ADO .Net

14BCT52 WEB TECHNOLOGY

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 1 0 4

Pre-requisites: Computer Networks and Java Programming

UNIT – I 9

HTML, HTTP and TELNET: Introduction - History of WWW - The Basics of WWW and Browsing – HTML - Creating links – Frames – Tables – Lists – Forms – Images - Style Sheets - Common Gateway Interface - Remote Login.

UNIT – II 9

DHTML: Introduction – Cascading Style Sheets – DHTML Document Object Model and Collections – Event Handling – Data Binding.

UNIT – III 9

XML: Communication Incompatibilities - XML versus HTML - Electronic Data Exchange - XML Terminology - Introduction to DTD - Document Type Declaration - Element Type Declaration - Attribute Declaration - Limitations of DTDs - Introduction to Schema - Complex Types - Extensible Stylesheet Language Transformation.

UNIT – IV 9

ASP: Introduction - Advantages of Using ASP - First ASP Script - Processing of ASP Scripts with Forms – Variables and Constructs – Subroutines – Include/Virtual – ASP Cookies – ASP Objects – Connecting to Data with ASP.

UNIT – V 9

ASP .NET: Introduction - Popular Web Technologies - ASP.NET Concept - Overview of .NET Framework - ASP.NET Details - Server Controls and Web Controls - Validation Controls.

Lecture:45, Tutorial:15, TOTAL : 60

TEXT BOOKS:

1. Godbole Achyut and Kahate Atul, “Web Technologies: TCP/IP, Web/Java Programming and Cloud Computing”, 3rd Edition, Tata McGraw Hill, New Delhi, 2014.
2. Gopalan N.P. and Akilandeswari J., “Web Technology A Developer’s Perspective”, Prentice-Hall of India Pvt. Ltd., New Delhi, 2008.

REFERENCE BOOKS:

1. Xavier C., “World Wide Web Design with HTML”, Tata McGraw Hill, New Delhi, 2008.
2. Deitel P.J. and Deitel H.M., “Internet and World Wide Web: How to Program”, 4th Edition, Prentice Hall of India, 2008.
3. Brian A. Croft, Rick Darnell, Shelly Powers, “Dynamic Web Publishing”, 2nd Edition, TechMedia, New Delhi, 2006.

Course Outcomes:

On completion of the course the students will be able to

- explore web technology concepts
- understand the server side programming technologies
- learn the concepts of scripting languages
- familiar with web programming
- understand the XML and its applications in web

Pre-requisites: Computer Networks and Operating Systems

UNIT – I 9

Characterization of Distributed Systems and Models: Introduction – Examples of Distributed Systems – Resource Sharing and the Web – Challenges – System Models: Introduction – Architectural Models – Fundamental Models.

UNIT – II 9

Interprocess Communication, Objects and Invocation: Introduction – API for the Internet Protocols – External Data Representation and Marshalling – Client and Server Communication – Group Communication - Distributed Objects and Remote Invocation: Introduction - Communication between Distributed Objects – Remote Procedural Call – Events and Notifications.

UNIT – III 9

Distributed File Systems and Time: Introduction – File Service Architecture –Introduction to Time in Distributed Systems – Clocks, Events and Process States – Synchronizing Physical Clocks – Logical Time and Clocks – Global States.

UNIT – IV 9

Process Coordination and Transactions: Introduction - Distributed Mutual Exclusion – Elections - Introduction – Transactions- Nested Transactions - Locks.

UNIT – V 9

Distributed Transactions, Replication and Shared Memory: Introduction – Flat and Nested Distributed Transactions – Atomic Commit Protocols – Introduction to Replication – System Model and Group Communication – Fault Tolerant Services – Introduction to Distributed Shared Memory – Design and Implementation Issues.

TOTAL : 45

TEXT BOOKS:

1. Coulouris George, Dollimore Jean and Kindberg Tim, “Distributed Systems Concepts and Design”, 4th Edition, Pearson Education, New Delhi, 2012.

REFERENCE BOOKS:

1. Tanenbaum Andrew S., Maarten van Steen, “Distributed Systems Principles and Paradigms”, 2nd Edition, Pearson Education, 2013.
2. Ajay D. Kshemkalyani, Mukesh Singhal, “Distributed Computing: Principles, Algorithms, and Systems”, Cambridge University Press, 2008.
3. Liu M.L.,” Distributed Computing: Principles and Applications”, Addison Wesley, 2004.

Course Outcomes:

On completion of the course the students will be able to

- identify concepts regarding the fundamental principles of distributed systems
- develop abstract models for understanding process interaction
- explain distributed file systems
- understand the issues related to timing, coordination of distributed transactions
- familiar with fault tolerant services

Pre-requisites: Computer Architecture

UNIT – I 9

Introduction to 8085 Microprocessor: Introduction – Microprocessor Instruction Set and Computer Languages – Large Computers To Single Chip Microcontrollers – Microprocessor Controlled Temperature System (MCTS) – 8085 Programming Model – Instruction Classification – Instruction, Data Format and Storage – Writing, Assembling and Executing a Simple Program-Overview of the 8085 Instruction Set (Excluding Timing Diagram).

UNIT – II 9

Microprocessor Architecture and Interfacing: Microprocessor Architecture and its Operations – Memory – Input and Output Devices (I/O) – The 8085 Micro Processing Unit (MPU) –Memory Interfacing – Interfacing I/O Devices using Decoders – Comparison of Memory Mapped I/O and Peripheral Mapped I/O.

UNIT – III 9

Interrupts: 8085 Interrupts – RST(Restart) Instructions – 8085 Vectored Interrupts: TRAP – RST7.5, 6.5, 5.5 – Block Diagram of 8259 Programmable Interrupt Controller – Direct Memory Access (DMA) – 8237 Direct Memory Access Controller.

UNIT – IV 9

Programmable Peripheral Devices: Block Diagram of 8255A Programmable Peripheral Interfaces – Block Diagram of Bidirectional Data Transfer Between Two Microcomputers – Block Diagram of 8254 (8253) Programmable Interval Timer – Block Diagram of 8279A Programmable Keyboard/Display Interface.

UNIT – V 9

Data Converters and Communication: Basics Concepts in Serial I/O – Software Controlled Asynchronous Serial I/O:Serial Data Transmission, Serial Data Reception-8085 Serial I/O Lines :SOD and SID-Hardware Controlled Serial I/O using Programmable Chips–Block Diagram of 8251A Architecture.

Lecture: 45, Practical: 45, TOTAL : 90

TEXT BOOKS:

1. Ramesh Gaonkar S., “Microprocessor Architecture, Programming and Applications with the 8085”, 6th Edition, Penram International Publishing (India) Pvt. Ltd., 2013.

REFERENCE BOOKS:

1. Douglas V. Hall, “Microprocessors and Interfacing, Programming and Hardware”, 2nd Edition, McGraw Hill International Edition, 2005.
2. Mathur Adithya P., “Introduction to Microprocessor”, 3rd Edition, Tata McGraw Hill, New Delhi, 2004.
3. Sunil Mathur, “Microprocessor 8085 and its Interfacing”, 2nd Edition, PHI Learning Pvt. Ltd., New Delhi, 2011.

Course Outcomes:

On completion of the course the students will be able to

- learn the hardware and software components of a microprocessor-based system
- develop assembly language programming using 8085 microprocessor
- acquire knowledge about integrating digital devices with microprocessor-based systems
- learn about interrupts in hardware and software components
- obtain knowledge about data communication in microprocessor-based systems

14BCL51 VISUAL PROGRAMMING LABORATORY
(Common to Computer Systems & Design and Information Systems)

0 0 2 1

LIST OF EXPERIMENTS / EXERCISES:

1. Working with Basic Common Controls, Branching and Looping
2. Implementation Constructor and Destructor
3. String Functions
4. Implementation of Polymorphism
5. Inheritance and Interface
6. Working with Menus and Dialog Controls
7. Implementation of Database

Case Study:

Electricity Bill Generation-Area calculation-Payroll Processing-Student Mark list Preparation-Billing System-Air line Reservation System-Banking Process-Library Management System-Stock Maintenance Application-Hospital Administrative Process-Railway Reservation Process.

TOTAL: 30

REFERENCES / MANUALS / SOFTWARE:

1. Windows Operating System
2. .Net Framework, VB.Net
3. SQL-Server

Course Outcome:

On completion of the course the students will be able to

- design applications using visual basic .Net controls
- implement object oriented programming concepts
- develop projects using ADO .Net

14BCL52 WEB PROGRAMMING LABORATORY
(Common to Computer Systems & Design and Software Systems)

0 0 2 1

LIST OF EXPERIMENTS /EXERCISES:

1. Write names of several countries in a paragraph and store it as world.html. Each country name must be a hot text. When you click India Image (for example), it must open the file and it should provide a brief introduction about India.
2. Design a HTML document describing you. Assign a suitable background design and background color and a text color
3. Write a HTML document to print your class Time Table.
4. Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML.
5. Develop a web page using image mapping and roll over effects.
6. Write a program using style sheet to create borders and to modify the font and text appearance.
7. Write a script to count the number of characters entered by user in a textbox and limit it to a particular number.
8. Create a form and validate it using java script.
9. Create a document using DHTML that changes the alignment of the heading to left, right and centered using the links given in the same document.
10. Create a XML document for displaying the book details.
11. Create an application in ASP to display a welcome message to the first time user along with the time.
12. Write a Cookie Program using ASP.NET that counts the number of access to a web page.

TOTAL : 30

REFERENCES / MANUALS / SOFTWARE:

1. Windows-Operating System
2. Java, C++

Course Outcomes:

On completion of the course the students will be able to

- create web pages using HTML and Cascading Styles sheets
- build dynamic web pages using JavaScript
- design interactive web applications using ASP and ASP.NET
- develop XML documents and XML DTD

14BCE01 OPERATIONS RESEARCH

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

Pre-requisites: Basic Knowledge in Mathematics

UNIT – I 9

Linear Programming: Mathematical formulation of Linear Programming Problem –Graphical solution –Simplex method –Artificial variable techniques-Big M Method –Simple problems only.

UNIT – II 9

Applications of Linear Programming: Transportation Model –Initial basic feasible solution – Northwest corner rule –Least cost method –Vogel’s approximation method –Balanced and unbalanced problems –Assignment model –Balanced problems –Unbalanced problems -Simple problems.

UNIT – III 9

Inventory Models: Deterministic inventory models –Static and dynamic EOQ Models –with or without shortage –Probabilistic inventory model –Discrete and continuous type -Simple problems.

UNIT – IV 9

Network Scheduling by PERT/CPM: Introduction –Network and basic components –Rules of Network construction –Time calculation in Networks –CPM.PERT –PERT calculations (without crashing).

UNIT – V 9

Game Theory: Two person zero-Sum Games-Maximin-Minimax Principle-Saddle Point and Value of the Game-Games without saddle points, Mixed strategies-Matrix oddment method for $n \times n$ games-Dominance property-Graphical method for $2 \times n$ or $m \times 2$ games-Simple problems.

TOTAL: 45

TEXT BOOKS:

1. Sundaresan V., Ganapathy Subramanian K.S. and Ganesan K., “Resource Management Techniques”, A.R. Publications, Arpakkam, 2013.

REFERENCE BOOKS:

1. Prem Kumar Gupta and Hira D.S., “Operations Research”, S. Chand & Co., Ram Nagar, New Delhi, 1997.
2. Sharma J.K., “Operations Research Theory and Application”, Macmillan, London, 2009.
3. Kantiswarup, Gupta P. K. and Man Mohan, “Operations Research”, Sultan Chand & Sons, New Delhi, 1999.

Course Outcomes:

On completion of the course the students will be able to

- identify and develop operational research models from the verbal description of the real system
- develop a complete procedure for solving different kinds of programming problems
- solve inventory and shortest route problems
- analyze network scheduling using CPM and PERT
- solve problems in game theory

14BCE02 PRINCIPLES OF MANAGEMENT

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

UNIT – I

Management Science and Society: Definition of Management – Managing Science or Art - The Evolution of Management Thought – Patterns of Management Analysis – The System Approach to Management Process- Functions of a Manager – Management and Society the External Environment, Social Responsibility and Ethics. 9

UNIT – II

Planning : Types of Plan – Steps in Planning – Objectives – Evolving Concepts in Management by Objectives – Strategies, Policies and Planning Premises: Nature and Purpose of Strategies and Policies – Strategic Planning Process – The TOWS Matrix – Blue Ocean Strategy- Portfolio Matrix - Major Kinds of Strategies and Policies – Hierarchy of Company Strategies – Porters Industry Analysis and Generic Competitive Strategies – Premising and Forecasting – Decision Making. 9

UNIT – III

Organizing and Staffing: Formal and Informal Organization – Organizational Division – Organization Levels and the Span of Management – An Organizational Environment for Entrepreneurship and Intrapreneurship – Reengineering the Organization – The Structure and Process of Organizing – Basic Question for Effective Organizing – Organization Structure Departmentation - Line / Staff Authority, Empowerment and Decentralization – Human Resource Management and Selection. 9

UNIT – IV

Leading: Human Factors in Managing – Motivation - Motivation – An Early Behavioral Model – Maslow’s Hierarchy of Needs Theory – Alderfers ERG Theory – Herzberg’s Motivation Hygiene Theory – The Expectancy Theory of Motivation – Equity Theory – Goal Setting Theory of Motivation – Skinners Reinforcement Theory – McClelland’s Needs Theory of Motivation – Special Motivational Techniques – Job Enrichment – A Systems and Contingency Approach to Motivation – Leadership - Communication: Purpose of Communication – Communication Process – Communication in the Organization – Barriers and Breakdowns in Communication – Toward Effective Communication – Electronic Media in Communication. 9

UNIT – V

Controlling : The Basic Control Process – Critical Control Points, Standards and Benchmarking – Control as a Feedback System – Real Time Information and Control – Feed Forward or Preventive Control – Control of Overall Performance – Profit and Loss Control – Control Through Return on Investment – Management Audits and Accounting Firms – The Balanced Scorecard- Bureaucratic and Clan Control – Requirements for Effective Control – Control Techniques and Information Technology. 9

TOTAL: 45

TEXT BOOKS:

1. Koontz Harold and Weihrich Heinz, “Essentials of Management”, 9th Edition, 6th Reprint , Tata McGraw Hill Publishing Company, New Delhi, 2014.

REFERENCE BOOKS:

1. Tripathi P.C. and Reddy P.N., “Principles of Management”, 2nd Edition, McGraw Hill, New York, 1991.
2. Chandra Bose, “Principles of Management and Administration”, Prentice Hall of India, New Delhi, 2001.
3. Mason Carpenter, Talya Bauer and Berrin Erdogan, “Principles of Management”, XanEdu Publishing Inc, New Delhi, 2009.

Course Outcomes:

On completion of the course the students will be able to

- understand the nature and purpose of management
- gain knowledge in planning, organizing and staffing strategies
- incorporate managerial procedures
- familiarize with controlling mechanisms
- develop leadership qualities

Pre-requisites: Operating Systems

UNIT – I 9

Operating System and Introduction to the Kernel: Main characteristics - LINUX Distribution - Compiling the Kernel - Important Data Structures - Main Algorithms - Implementation of System Calls.

UNIT – II 9

Memory Management: The Architecture - Independent Memory Model-The Virtual Address Space of a Process - Block Device Caching - Paging under LINUX.

UNIT – III 9

Inter process Communication and Multiprocessing: Synchronization in the Kernel-Communication via Files – Pipes - Debugging using ptrace - System Vs IPC-IPC with Sockets-Multiprocessing: The Intel Multiprocessor Specification - Problem with Multiprocessor Systems - Changes to the Kernel-Atomic Operations - Spin Locks.

UNIT – IV 9

The LINUX File System: Basic Principles - The Representation of File Systems in the Kernel - The Ext2 File System-The Proc File System.

UNIT – V 9

Device Drivers under LINUX: Character and Block Devices – Hardware – Polling - Interrupts and Waiting Queues-Implementing a Driver - Dynamic and Static Drivers.

TOTAL: 45

TEXT BOOKS:

1. Michael Beck, Harald Bohme, Mirko Dziadzka, Ulrich Kunitz, Robert Magnus, Claus Schroter and Dirk Verworner "LINUX Kernel Programming", 3rd Edition, Pearson Education, 2010.

REFERENCE BOOKS:

1. Robert Love, "LINUX Kernel Development", Pearson Education, 2010.
2. Daniel P. Bovet and Marco Cesati, "Understanding the LINUX Kernel", O'Reilly Media Inc., 2005.
3. Claudia Salzberg Rodriguez, Gordon Fischer and Steven Smolski, "The LINUX Kernel Primer: A Top-Down Approach for X86 and Powerpc Architectures", Pearson Education, 2009.

Course Outcomes:

On completion of the course the students will be able to

- understand the Linux Kernel
- gain knowledge on memory management
- employ interprocess communication methods
- explore the concept of file systems
- familiarize with Linux device drivers

Pre-requisites: Fundamentals of Computing

UNIT – I

9

Overview of Computer Graphics: Video Display Devices- Raster Scan Systems-Random Scan Systems – Graphics Monitors and Workstations - Interactive Input devices - Hard Copy Devices - Graphics Software.

UNIT – II

9

Output Primitives and Attributes: Points and Lines – Line-Drawing Algorithms - Circle Generating Algorithms - Line Attributes – Curve Attributes - Color and Grayscale Levels – Area Fill Attributes - Character Attributes – Bundled Attributes.

UNIT – III

9

Two-Dimensional Transformations and Viewing: Basic Transformations - Matrix Representations - Composite Transformations - Other Transformations. Two Dimensional Viewing: Viewing Pipeline – Window to Viewport Coordinate Transformation - Clipping Operations - Cohen Line Clipping - Hodgeman Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

UNIT – IV

9

Three-Dimensional Concepts, Transformations and Viewing: Three-Dimensional Display Methods – Three-Dimensional Geometric and Modeling Transformations: Translation – Rotation – Scaling – Other Transformations - Composite Transformations – Three-Dimensional Transformation Functions – Modeling and Coordinate Transformations – Viewing Pipeline – Viewing Coordinates - Projections.

UNIT – V

9

Visible - Surface Detection Methods, Color Models and Animation: Visible-Surface Detection Methods – Properties of Light – Standard Primaries and the Chromaticity Diagram – Intuitive Color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HSV Color Model – Conversions between HSV and RGB Models – HLS Color Model – Color Selection and Applications – Computer Animation.

TOTAL: 45

TEXT BOOKS:

1. Hearn D. Donald and Baker M. Pauline, “Computer Graphics C Version”, 2nd Edition, Pearson Education, 2013.

REFERENCE BOOKS:

1. Desai A. Apurva, “Computer Graphics”, Prentice Hall of India, 2008.
2. Sinha N. Amarendra and Udai D. Arun, “Computer Graphics”, Tata McGraw Hill Publishing Company, 2008.
3. Peter Shirley and Michael Ashikhmin, “Fundamentals of Computer Graphics”, 3rd Edition, CRC Press, 2009.

Course Outcomes:

On completion of the course the students will be able to

- understand the fundamentals of computer graphics
- familiarize with graphic algorithms
- explore the 2D and 3D transformations
- gain knowledge on clipping algorithms
- identify the surface detection and colour models

Pre-requisites: Operating Systems

UNIT – I

9

Introduction and Lexical Analysis: Compiler - Compiler Applications - Phases of a Compiler - Challenges in Compiler Design - Compilation Process - An Example -Lexical Analysis: Role of Lexical Analyzer - Specification of Tokens - Token Recognition - Regular Expression to NFA - Lexical Analysis Tool-Lex.

UNIT – II

9

Syntax Analysis: Role of Parser - Error Handling - Grammar – Top Down Parsing – Bottom Up Parsing - LR Parsing - LALR Parser Generator-yacc- Syntax Directed Translation.

UNIT – III

9

Type Checking, Symbol Tables and Runtime Environment Management: Static vs. Dynamic Checking - Type Expressions - Type Checking - Type Equivalence - Type Conversion - Symbol Tables: Information in Symbol Table - Features of Symbol Tables - Simple Symbol Table - Scoped Symbol Table -Runtime Environment Management: Introduction- Activation Record – Display.

UNIT – IV

9

Intermediate and Target Code Generation: Intermediate Languages - Intermediate Language Design Issues - Intermediate Representation Techniques - Statements in Three Address Code - Implementation of Three Address Instructions – Three Address Code Generation- Target Code Generation: Factors Affecting Code Generation - Basic Block -Code Generation for Trees - Register Allocation - Cache Management - Code Generation using Dynamic Programming.

UNIT – V

9

Code Optimization: Need for optimization - Problems in Optimizing Compiler Design - Classification of Optimization - Factors Influencing Optimization - Themes Behind Optimization Techniques- Optimizing Transformations - Local Optimization - Global Optimization - Computing Global Data Flow Information - Setting Up Data Flow Equations - Iterative Data Flow Analysis.

TOTAL: 45

TEXT BOOKS:

1. Santanu Chattopadhyay, “Compiler Design”, 1st Edition, Prentice Hall of India, New Delhi, 2012.

REFERENCE BOOKS:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi and Jeffrey D. Ullman, “Compilers: Principles, Techniques and Tools”, 2nd Edition, Pearson Education (Singapore) Pvt.Ltd., 5th Impression 2013.
2. Srikant Y.N. and Priti Shankar, “The Compiler Design Handbook: Optimizations and Machine Code Generation”, 2nd Edition, 2007.
3. Alexander Meduna, “Elements of Compiler Design”, Auerbach Publications, 2007.

Course Outcomes:

On completion of the course the students will be able to

- understand lexical analysis and tokens
- gain knowledge on parsing methods
- explore the features of symbol table
- familiarize with code generation techniques
- identify the need for code optimization

14BCE06 E-COMMERCE

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

Pre-requisites: Fundamentals of Computing

UNIT – I 9

Business Models for E-commerce: Business Model - E-Business Models Based on the Relationship of Transaction Parties - E-Business Models Based on the Relationship of Transaction Types.

UNIT – II 9

E-Marketing: Traditional Marketing - Identifying Web Presence Goals - Browsing Behaviour Model - Online Marketing - E-Advertising - Internet Marketing Trends - Target Markets - E-Branding - Marketing Strategies.

UNIT – III 9

E-Payment Systems: E-Banking at ICICI Bank - Concerns in Internet Banking - Digital Payment Requirements - Digital Token-based E-Payment Systems - Classification of New Payment Systems - Electronic Cash - Risk and E-Payment Systems - Designing E-Payment Systems - Digital Signature - Online Financial Services in India - Online Stock Trading.

UNIT – IV 9

E-Supply Chain and Value Chain Management: E-Supply Chain Management: Supply Chain-Supply Chain Management at Marico Industries - Mahindra & Mahindra - Amul Diary - CISCO-Virtual Value Chain - Seven Dimensions of E-Commerce Strategy - Value Chain and E-Strategy-Planning the E - Commerce Project.

UNIT – V 9

E-Security, Legal and Ethical Issues: E-Security: Information System Security - Security on the Internet - E-Business Risk Management Issues - Information Security Environment in India - Legal and Ethical Issues.

TOTAL : 45

TEXT BOOKS:

1. Joseph P.T. and S.J., “E-Commerce An Indian Perspective”, 5th Edition, PHI Learning Pvt. Ltd., New Delhi, 2015.

REFERENCE BOOKS:

1. Kalakota Ravi and Whinston Andrew B., “Frontiers of Electronic Commerce”, Pearson Education, 2004.
2. Whitely David, “E-Commerce Strategy, Technologies and Applications”, McGraw-Hill, Singapore, 2008.
3. Awad Elias M., “Electronic Commerce from Vision to Fulfillment”, 3rd Edition, Prentice-Hall of India, New Delhi, 2007.

Course Outcomes:

On completion of the course the students will be able to

- gain knowledge on business models for electronic commerce
- expose strategies for marketing and secured payment
- acquire skills in legal and ethical issues
- analyze various value chains
- understand the need of security in e-commerce

14BCE07 CLOUD COMPUTING

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

Pre-requisites: Computer Networks

UNIT – I

9

Introduction to Cloud, Parallel and Distributed Computing: Overview of Cloud Computing - Historical Developments - Building Cloud Computing Environments - Computing Platforms and Technologies - Principles of Parallel and Distributed Computing: Computing Eras-Parallel vs Distributed Computing - Elements of Parallel Computing - Elements of Distributed Computing - Technologies for Distributed Computing.

UNIT – II

9

Virtualization: Introduction to Virtualization - Characteristics of Virtualized Environments - Taxonomy of Virtualization Techniques - Virtualization and Cloud Computing - Pros and Cons of Virtualization - Technology Examples.

UNIT – III

9

Cloud Computing Architecture: Introduction - Cloud Reference Model - Types of Clouds - Economics of the Cloud - Open Challenges.

UNIT – IV

9

Data Intensive Computing: Introduction to Data Intensive Computing - Characterizing Data Intensive Computations – Challenges - Historical Perspective - Technologies for Data Intensive Computing Storage Systems - Programming Platforms - Aneka Map Reduce Programming - Introducing the Map Reduce Programming Model.

UNIT – V

9

Cloud Platforms and Applications: Amazon Web Services - Compute Services - Storage Services - Communication Services - Additional Services - Google AppEngine - Architecture and Core Concepts - Application Life Cycle - Cost Model - Microsoft Azure - Azure Core Concepts - SQL Azure - Windows Azure Platform Appliance - Cloud Applications: Scientific Applications – Healthcare – Biology – Geoscience - Business and Consumer Applications - CRM and ERP – Productivity - Social Networking - Media Applications - Multiplayer Online Gaming.

TOTAL : 45

TEXT BOOKS:

1. Buyya Rajkumar, Vecchiola Christian and Thamarai Selvi S., “Mastering Cloud Computing”, McGraw Hill Education Pvt. Ltd., New Delhi, 2013.

REFERENCE BOOKS:

1. Rittinghouse John.W and Ransome James F, “Cloud Computing Implementation, Management and Security” , CRC Press, 2012.
2. Miller Michael, “Cloud Computing Web-Based Applications that Change the Way You Work and Collaborate Online”, Pearson Education, 2013.
3. Saurabh Kumar, “Cloud Computing Unleashing Next Gen Infrastructure to Application”, 3rd Edition, Wiley India Pvt. Ltd., New Delhi, 2014.

Course Outcomes:

On completion of the course the students will be able to

- outline the applications of cloud services in real time scenarios
- categorize the architecture, infrastructure and delivery models of cloud computing
- analyze the core issues and standards of cloud computing
- know the advancements in cloud computing
- identify the different cloud platforms

14BCE08 SOFTWARE PROJECT MANAGEMENT

(Common to Computer Systems & Design, Information Systems and Software Systems)

3 0 0 3

Pre-requisites: Fundamentals of Computing

UNIT – I 9

Introduction: Introduction to Software Project Management – Project Evaluation and Programme Management: Introduction – A Business Case – Project Portfolio Management - Evaluation of Individual Projects - Cost benefit Evaluation Techniques - Risk Evaluation - Programme Management - Managing the Allocation of Resources - Strategic Programme Management - Creating a Programme - Aids to Programme Management - Some Reservation about Programme Management - Benefits Management.

UNIT – II 9

Project and Activity Planning: An Overview of Project Planning - Activity Planning: Introduction – The Objectives of Activity Planning – When to Plan - Project Schedules - Projects and Activities – Sequencing and Scheduling Activities - Network Planning Models – Formulating a Network Model – Adding the Time Dimensions – The Forward and Backward Pass – Identifying Critical Path – Activity Float – Shortening the Project Duration - Identifying Critical Activities – Activity on Arrow Networks.

UNIT – III 9

Resource Allocation and Progress Monitoring: Resource Allocation: Introduction – Nature of Resources – Resource Requirements – Scheduling Resources – Creating Critical Paths – Counting the Cost – Publishing the Resource Schedule – Cost Schedules – Scheduling Sequence - Monitoring and Control: Introduction - Creating the Framework - Collecting the Data - Review-Project Termination Review – Visualizing Progress - Cost Monitoring - Earned Value Analysis - Prioritizing Monitoring - Getting the Project Back to Target - Change Control

UNIT – IV 9

Managing Contracts and People in Software Environment: Managing Contracts: Introduction - Types of Contract - Stages in Contract Placement - Typical Terms of a Contract - Contract Management – Acceptance – Managing People in Software Environments: Introduction - Understanding Behaviour – Organizational Behaviour - Selecting Right Person – Instruction – Motivation – Oldham Hackman Model – Stress – Healthy and Safety - Ethical and Professional Concerns.

UNIT – V 9

Working in Teams: Introduction – Becoming a Team - Decision Making – Organization and Team Structures - Coordination Dependencies – Dispersed and Virtual Teams – Communication Genres – Communication Plans – Leadership.

TOTAL : 45

TEXT BOOKS:

1. Hughes Bob, Cotterell Mike and Mall Rajib, “Software Project Management”, 5th Edition, 11th Reprint 2014, Tata McGraw-Hill, New Delhi.

REFERENCE BOOKS:

1. Roger S. Pressman, “Software Engineering- A practitioners Approach”, 7th Edition, McGraw Hill, New York, 2014.
2. Gray Clifford F. and Larson Erik W., “Project Management, The Managerial Process”, 3rd Edition, McGraw-Hill, New Delhi, 2008.
3. Jalote Pankaj, “Software Project Management in Practice”, Pearson Education, New Delhi, 2005.

Course Outcomes:

On completion of the course the students will be able to

- learn project managerial aspects in software development
- identify the basic steps in project management
- know the issues in project monitoring and control
- acquire knowledge on project and activity planning
- understand different roles in team work

Pre-requisites: Computer Architecture and Computer Networks

UNIT – I 9

Introduction and OGSA: Introduction to the Grid - OGSA: Traditional Paradigms for Distributed Computing - Web Services – OGSA - Globus Toolkit 3.

UNIT – II 9

Semantic Grid, Autonomic Computing and Grid Security: Introduction - Metadata and Ontology in the Semantic Web- Semantic Web Services- Layered Structure of the Semantic Grid - Semantic Grid Activities - Autonomic Computing - Grid Security: Introduction – Security Primer – Cryptography - Grid Security.

UNIT – III 9

Grid Monitoring: Introduction - Grid Monitoring Architecture - Review Criteria - Overview of Grid Monitoring Systems.

UNIT – IV 9

Grid Scheduling and Resource Management: Introduction - Scheduling Paradigms - Working of Scheduling - Review of Condor - SGE, PBS and LSF - Grid Scheduling with QoS.

UNIT – V 9

Grid Portals and Applications: Introduction - First Generation Grid Portals - Second Generation Grid Portals - Grid Applications: Introduction - GT3 Use Cases - OGSA - DAI Use Cases - Resource Management Case Studies - Grid Portal Use Cases - Workflow Management.

TOTAL : 45

TEXT BOOKS:

1. Li Maozhen and Baker Mark, “The Grid Core Technologies”, Wiley India, 2013.

REFERENCE BOOKS:

1. Joseph Joshy and Fellenstein Craig, “Grid Computing”, Pearson Education, New Delhi, 2013.
2. Abbas Ahmar, “Grid Computing: A Practical Guide to Technology and Applications”, Laxmi Publications (Firewall Media), New Delhi, 2013.
3. Foster Ian and Kesselman Carl, “The Grid2: Blueprint for a New Computing Infrastructure”, 2nd Edition, Morgan Kufman Publisher(Elsevier India Pvt. Ltd.), 2012.

Course Outcomes:

On completion of the course the students will be able to

- gain knowledge on grid semantic and security
- explore grid scheduling and resource management
- acquire knowledge on applications of grid
- understand the concepts of cryptography and ontology
- identify the various grid based applications

Pre-requisites: Computer Networks

UNIT – I 9

Fundamentals and Basics of Wireless Networks: Digital Communications – Wireless Communications System – Wireless Media – Types of Wireless Communication Systems – Wireless Network – Wireless Network Architecture – Classification of Wireless Networks – Wireless Switching Technology – Wireless Communication Problems - Wireless Network Reference Model – Wireless Networking Issues : Traffic and Resource Allocation – Flow Control – Error Control – Security and Privacy – Mobility – Routing – QoS Management – Radio Access – Channel Allocation Scheme – Power Management – Pricing – Degree of Subscriber Control over Service Profile.

UNIT – II 9

Wireless Personal Area Networks: Overview of WPAN – Network Architecture – Piconet and Scatternet – WPAN Components – Requirements of WPAN Devices – WPAN Technologies and Protocols – Bluetooth – IEEE 802.15.2 – HRWPAN – LRWPAN – IEEE 802.15.5 – WPAN Applications.

UNIT – III 9

Wireless Local Area Networks: Network Components – WLAN Adapters – Access Points – Outdoor WLAN Bridges – WLAN Router – Design Requirements of WLAN – Network Architecture – Infrastructure Based WLAN – Infrastructureless WLAN - WLAN Standards – IEEE 802.11 – WLAN Protocols – Physical Layer Protocols - MAC Layer Protocols – Routing in WLAN – IEEE 802.11p – Physical Layer – MAC Layer – WLAN Applications – Home Area Networks.

UNIT – IV 9

Wireless Metropolitan Area Networks: Introduction to WMAN- IEEE 802.16 Standards – Advantages – IEEE 802.16 vs. IEEE 802.11 – WMAN Network Architecture - Network Components – Features of WiMAX – WiMAX Mobility Support – Network Protocols - Physical Layer – MAC Layer – Broadband Wireless Networks - Wireless Local Loop - Local Multipoint Distribution Service – Multichannel Multipoint Distribution Service – Comparison of LMDS and MMDS – Wireless ATM – WMAN Applications - Wireless Service Provider Backhaul – Banking Networks – Education Networks – Public Safety.

UNIT – V 9

Wireless Adhoc Networks: Introduction to Wireless Adhoc Networks - Features – Advantages – Applications – Adhoc Networks versus Cellular Networks – Mobile Ad Hoc Networks: Network Architecture – Protocols – Technologies – Applications – Wireless Sensor Networks: Network Architecture – Protocols – Technologies – Applications – Wireless Mesh Networks: Network Architecture – Protocols Technologies – Applications – Vehicular Ad Hoc Network - Unique Characteristics of VANETs – Network Architecture – Protocols – Technologies – Applications.

TOTAL : 45

TEXT BOOKS:

1. Dr. Sunilkumar S. Manvi, Mahabaleshwar S. Kakkasageri, “Wireless and Mobile Networks Concepts and Protocols”, Wiley India, 2010.

REFERENCE BOOKS:

1. William Stallings, ”Wireless Communications & Networks”, 2nd Edition, Pearson Education, 2009.
2. Ron Price,” Fundamentals of Wireless Networking”, McGraw Hill Education (India), 2013.
3. Clint Smith, Daniel Collins P.E., “Wireless Networks Design and Integration for LTE, EVDO, HSPA, AND WiMAX”, 3rd Edition, McGraw Hill Education, 2014.

Course Outcomes:

On completion of the course the students will be able to

- distinguish wireless network architectures
- know the design issues of various wireless networks
- classify the protocols of different wireless networks
- categorize the applications of wireless networks
- learn the various communication techniques of wireless networks

Pre-requisites: Computer Networks

UNIT – I

9

Introduction and Encryption Techniques: Security –Elements of Information Security -Security Policy and Techniques - Steps for Better Security - Category of Computer Security – The Operational Model - Security Services - Basic Network Security Terminology- Security Attacks-Data Encryption Techniques: Introduction - Encryption Methods – Cryptography – Substitution Ciphers – Transposition Ciphers – Cryptanalysis – Steganography.

UNIT – II

9

Data Encryption Standards and Symmetric Ciphers: Introduction – Block Ciphers – Modes of Operation – Feistel Ciphers – Data Encryption Standard – Triple DES – DES Design Criteria – Other Block Ciphers – Differential Cryptanalysis – Linear Cryptanalysis - Introduction - Blowfish Encryption Algorithm - RC5 - RC4 - RC6 - Comparison between RC6 and RC5 – IDEA

UNIT– III

9

Public Key Cryptosystems and Electronic Mail Security: - Public Key Cryptosystems: Introduction - Public key Cryptography - RSA Algorithm - E Mail Security: Introduction - PGP – MIME – S/MIME – Comparison of PGP and S/MIME.

UNIT- IV

9

Web Security and Intrusion: Introduction – SSL – SSL Session and Connection - SSL Record Protocol – Change Cipher Spec Protocol – Alert Protocol – Handshake Protocol – Secure Electronic Transactions – Intrusion : Introduction - Intrusion Detection System – Anomaly based IDS – Misuse Based IDS – Distributed IDS – Base Rate Fallacy – Password Management Practices – Limitations and Challenges of IDS.

UNIT – V

9

Malicious Software and Firewalls: Introduction - Malicious Code – Viruses – Worms – Trojans – Spyware –Bots - Best Practices – Digital Immune System – Attacks – Firewall : Introduction - Characteristics – Types – Benefits - Limitations - Architectures – Trusted System – Access Control.

TOTAL: 45

TEXT BOOKS:

1. Pachghare V.K., “Cryptography and Information Security”, 2nd Edition, PHI Learning Pvt. Ltd., New Delhi, 2015.

REFERENCE BOOKS:

1. Merkow, Breithaput, “Information Security Principles and Practices”, 2nd Edition, Pearson Education, New Delhi, 2014.
2. Mark Rhodes, “Information Security: The Complete Reference”, 2nd Edition, McGraw Hill Education, 2013.
3. Peltier Thomas P., “Information Security Fundamentals”, 2nd Edition, CRC Press, 2014.

Course Outcomes:

On completion of the course the students will be able to

- learn the basic concepts of information security
- realize the importance of cryptographic algorithms
- understand the significance of E-mail security
- analyze the threats of malicious software
- know the architecture of IP security and applications of computer forensics

Pre-requisites: Computer Networks

UNIT – I

9

Basic Concepts of SNMP Network Management: Network Management Standards - Network Management Models – Organization Models – Information Model - Communication Model – Abstract Syntax Notation One – Encoding Structure – Macros – Functional Model.

UNIT – II

9

SNMPv1 Network Management Models: History of SNMP Management – Internet Organizations and Standards - Organizations – Internet Documents – SNMP Model – Organization Model – System Overview – Information Model - Introduction – Structure of Management Information – Managed Objects – Management of Information Base.

UNIT – III

9

SNMPv2 Network Management: Major Changes in SNMPv2 – System Architecture – SNMPv2 Structure of Management Information - SMI Definitions – Information Modules – SNMP Keywords – Module Definitions – Object Definitions – Textual Conventions – Creation and Deletion of Rows – Notification - Conformance Statements – SNMPv2 Management Information Base - Changes – Information for Notification – Conformance Information - Expanded Internet - SNMPv2 Protocol - Data Structure and Protocol Operations – Compatibility with SNMPv1- Bilingual Manager – SNMP Proxy Server.

UNIT – IV

9

Network Management Tools, Systems and Engineering: System Utilities for Management - Basic Tools – SNMP Tools – Protocol Analyzer – Network Statistics Measurement Systems - Traffic Load Monitoring - Protocol Statistics – Data and Error Statistics –MRTG - MIB Engineering - Principles and Limitations of SMI – Counters vs Rates – Object Oriented Approach – SMI Tables – SMI Actions – SMI Transactions - NMS Design – Network Management Systems.

UNIT – V

9

Network Management Applications: Configuration Management - Network Provisioning – Inventory Management – Network Topology – Fault Management - Fault Detection - Fault Location and Isolation Techniques – Performance Management - Metrics – Data Monitoring – Problem Isolation – Performance Statistics – Event Correlation Techniques - Rule Based Reasoning – Model Based Reasoning – Case Based Reasoning – Codebook Correlation Model –State Transition Graph Model – Finite State Machine Model – Security Management – Accounting Management – Report Management – Policy Based Management – Service Level Management.

TOTAL : 45

TEXT BOOKS:

1. Mani Subramanian, “Network Management - Principles and Practice”, Pearson Education, 2013.

REFERENCE BOOKS:

1. Dinesh Chandra Verma, “ Principles of Computer Systems and Network Management”, Springer 2011.
2. William Stallings, “SNMP,SNMPv2,SNMPv3,RMON 1 and 2”, 3rd Edition, Pearson Education, 2013.
3. Richard Burke J., “Network Management: Concepts and Practice , A Hands on approach”, 1st Edition, Pearson Education, 2008.

Course Outcomes:

On completion of the course the students will be able to

- know the concepts and core issues of SNMP
- predict the various network management models
- identify the various network management tools and systems
- compare the functionalities of different versions of SNMP
- analyze the applications of network management

Pre-requisites: Client Server Computing

UNIT – I

9

Introduction to Distributed Object Technology: Evolution of Distributed Systems – Object Technology – Preview of Object Orientation – Distributed Object Systems – Client/Server Architecture – Multitier Architecture-Servers

UNIT – II

9

Introduction to Middleware Technologies: Middleware – Client/Server Building Blocks – Peer to Peer Communications – RPC Middleware – Messaging - Java RMI – Overview of CORBA – Overview of DCOM

UNIT- III

9

EJB Architecture and CORBA: Overview of EJB Software Architecture – View of EJB Conversion – Building and Deploying EJBs – Roles in ,EJB- CORBA : Introduction and Concepts – CORBA Components – Architectural Features – Method Invocations – Static and Dynamic CORBA – Structure of CORBA IDL – Self Describing Data Type – Interface Repository

UNIT- IV

9

COM and .NET: Evolution of DCOM – Introduction to COM – Clients and Servers – IDL – Interfaces – Threading Models – Marshalling – Comparison of RMI, CORBA, DCOM – Introduction to .NET – The .NET Framework Architecture – Remoting

UNIT – V

9

SOA Fundamentals and Web Services Technologies: Defining SOA- Business Value – Characteristics – Defining a Service – Concept of a Service – SOA Infrastructure – EAI – ESB – Conceptual Model – SOA Architecture- Analysis and Design – Web Service Technologies : XML Technologies – XML DTD – XML XSD – XSL – XSLT Introduction- XPath – XQuery

TOTAL: 45

TEXT BOOKS:

1. Sadhasivam Sudha G., Shankarmani Radha, “Middleware & Enterprise Integration Technologies”, Wiley India Pvt. Ltd., New Delhi, 2013.

REFERENCE BOOKS:

1. Qusay H. Mahmoud, “Middleware for Communications”, John Wiley & Sons, 2004.
2. Chris Britton, Peter Bye, “IT Architecture and Middleware: Strategies for Building Large Integrated Systems”, 2nd Edition, Addison Wesley Publications, 2009.

Course Outcomes :

On completion of the course the students will be able to

- know the various client server computing models
- understand the dynamic remote application with CORBA
- acquire knowledge on COM components and .NET technologies
- identify suitable middleware for application problems
- understand the basic concepts of Web Services and SOA

Pre-requisites: Object Oriented Programming using C++

UNIT – I 9

C# Introduction and Environment: Need for C# - Evolution - Characteristics - Applications – Comparison of C # with C++ and JAVA - Understanding .NET: C# Environment - .NET Strategy - Origins - .NET Framework - Common Language Runtime - Framework Base Classes - User and Program Interfaces - Visual Studio .NET - Languages - Benefits - C# and the .NET - Overview of C#.

UNIT – II 9

Decision Making, Looping and Methods: Introduction - while, do, for, foreach Statements - Jumps in Loops - Methods in C#: Introduction - Declaring Methods - Main Method - Invoking Methods- Nesting of Methods- Method Parameters - Pass by Value - Pass by Reference - Output Parameters - Variable Argument Lists - Method Overloading.

UNIT – III 9

Structures, Enumerations, Classes and Objects: Introduction - Structures - Structs with Methods - Nested Structs – Differences between Classes and Structs – Enumerations – Enumerator Initialization - Base Types - Type Conversion - Classes and Objects: Introduction - Basic Principles - Defining a Class - Adding Variables and Methods - Member Access Modifiers - Creating Objects - Accessing Class Members - Constructors - Overloaded Constructors - Static Members - Static Constructors - Private and Copy Constructors – Destructors - Member Initialization - this Reference - Nesting of Classes - Constant and Read Only Members - Properties - Indexers.

UNIT – IV 9

Inheritance, Polymorphism and Interface: Introduction - Classical and Containment Inheritance - Subclass - Visibility Control - Subclass Constructors - Multilevel Inheritance - Hierarchical Inheritance - Overriding Methods - Hiding Methods - Abstract Classes and Methods - Sealed Classes and Methods – Polymorphism – Interfaces: Introduction - Defining an Interface - Extending an Interface - Implementing Interfaces - Interfaces and Inheritance - Explicit Interface Implementation - Abstract Class and Interfaces.

UNIT – V 9

Operator Overloading, Delegates and Events: Introduction - Overloadable Operators - Need for Operator Overloading - Defining Operator Overloading - Overloading Unary Operators - Overloading Binary Operators - Overloading Comparison Operators - Delegates and Events: Introduction – Delegates - Delegate Declaration - Delegate Methods - Delegate Instantiation - Delegate Invocation - Using Delegates - Multicast Delegates - Events.

TOTAL: 45

TEXT BOOKS:

1. Balagurusamy E., “Programming in C#”, 3rd Edition, Tata McGraw-Hill, 2013.

REFERENCE BOOKS:

1. Lippman B. Stanley, “C# Primer: A Practical Approach”, Pearson Education, 2001.
2. Hejlsberg Anders, Torgersen Mads, Wiltamuth Scott and Golde Peter, “The C# Programming Language”, 4th Edition, Addison-Wesley, 2011.
3. Schildt Herbert, “C# 4.0 The Complete Reference”, McGraw-Hill, 2010.

Course Outcomes:

On completion of the course the students will be able to

- understand the difference between C#, C++ and JAVA
- know the framework and environment of C#
- develop C# programs using object oriented concepts
- acquire knowledge on delegates and events
- understand the basics of .NET environment

Pre-requisites: Object Oriented Programming

UNIT – I

9

Introduction: The .NET Framework –Programming Framework-.Net Languages-Common Language Runtime-Class Library-ASP .NET-Visual Studio .NET– Learning the .NET Languages: The .NET Languages –Data Types – Declaring Variables – Scope and Accessibility – Variable Operations – Object Based Manipulation – Conditional Structures –Loop Structures - Functions and Subroutines.

UNIT – II

9

IIS and ASP.NET Applications: Setting Up ASP .NET and Internet Information Server (IIS): IIS Manager – Installing ASP .NET – Migrating from ASP- ASP .NET Applications – Code Behind – The Global .aspx Application File – Understanding ASP .NET Classes – ASP .NET Configuration.

UNIT – III

9

Web Form Fundamentals and Web Controls: A Simple Page Applet – Improving the Currency Converter – HTML Control Classes – The Page Class-Web Controls: Stepping Up to Web Controls - Web Control Classes – AutoPostBack and Web Control Events – A Simple Web Page Applet – Assessing Web Controls.

UNIT – IV

9

Validation and Error Handling: Validation and Rich Controls- Validation – A Simple Validation Example – Understanding Regular Expressions – A Validated Customer Form-Tracing, Logging and Error Handling: Common Errors – The .NET Exceptions Object – Handling Exceptions – Throwing Own Exception-Logging Exceptions – Error Pages – Page Tracing.

UNIT – V

9

Overview of ADO .NET And Data Access: Introducing of ADO .NET and Data Management – Characteristics of ADO .NET – The ADO .NET Object Model- SQL Basics – The SQL Select Statement – The SQL Update Statement – The SQL Insert Statement – The SQL Delete Statement – Accessing Data – Creating a Connection – Defining a Select Command – Using a Command With a Data Reader.

TOTAL: 45

TEXT BOOKS:

1. MacDonald Matthew, “ASP .NET: The Complete Reference”, Tata McGraw Hill Publishing Company, New Delhi, 2010.

REFERENCE BOOKS:

1. Stephen Walther, Hoffman Kevin and Dudek Nate, “ASP .NET UNLEASHED”, Pearson Education, 2011.
2. Evjen Bill, Hanselman Scott and Rader Devin, “Professional ASP .NET 3.5: In C# and VB”, John Wiley & Sons, 2011.
3. MacDonald Matthew, “Beginning ASP .NET 4 in C# 2010”, Apress, 2010.

Course Outcomes:

On completion of the course the students will be able to

- familiarize with .NET environment
- handle errors and validate the projects
- create a web page with server controls
- gain knowledge on page controls and components
- design dynamic pages

UNIT – I

Natural Resources: Introduction - Forest Resources-Water Resources - Mineral Resources - Food Resources - Energy Resources - Land Resources - Conservation of Natural Resources - Equitable Use of Resources for Sustainable Life Style.

UNIT – II

Ecosystem: Introduction - Food Chain - Food Web – Ecological Succession – Forest Ecosystem - Grassland Ecosystem - Desert Ecosystem -Aquatic Ecosystem - Biodiversity – Biogeographical Classification of India – Value of Biodiversity– Hotspots of Biodiversity – Biodiversity at Global Level- Biodiversity at National Level - Biodiversity at Local Level - India as a Mega Diversity Nation - Threats to Biodiversity- Endangered Species of India - Endemic Species - Conservation of Biodiversity.

UNIT – III

Environmental Pollution: Introduction - Air Pollution – Climate Change - Green House Effect - Acid Rain - Ozone Layer Depletion - Nuclear Holocaust - Water Pollution -Land or Soil Pollution - Marine Pollution - Noise Pollution - Thermal Pollution - Nuclear Hazards - Solid Waste Management - Role of individual in Prevention of Pollution - Disaster Management.

UNIT – IV

Water Treatment Methods and Social Issues: Treatment of Water for Domestic Supply – Estimation of Dissolved Oxygen - Estimation of BOD - Estimation of COD – Bacteriological Examination of Water - Sewage Treatment - Self Purification of Natural Water - Membrane Technology for Wastewater Treatment - Carbon in Pollution Abatement of Air and Waste Water - Social Issues and the Environment: Introduction - Unsustainable to Sustainable Development – Urban Problems Related to Energy – Water Conservation- Rain Water Harvesting- Watershed Management – Resettlement and Rehabilitation- Environmental Ethics Issues and Possible Solution – Wasteland Reclamation – Consumerism and Waste Products – Environmental Legislation and Laws - Issues Involved in Enforcement of Environmental Legislation – Public Awareness.

UNIT – V

Human Population and Chemistry for Sustainable Future: Human Population and the Environment: Introduction – Population Growth – Variation of Population among Nations - Population Explosion – Family Welfare Programmes – Environment and Human Health – Human Rights and Environment – Value Education – HIV/AIDS – Women and Child Welfare – Role of Information Technology in Environment and Human Health - Chemistry for Sustainable Future.

TOTAL: 45**TEXT BOOKS:**

1. Palanisamy P.N., Manikandan P, Geetha A, Manjula Rani K and Kowshalya V.N., “Environmental Science”, 3rd Edition, Pearson India Education Services Pvt. Ltd., 2015.

REFERENCE BOOKS:

1. Erach Bharudcha, “Textbook of Environmental Studies for Undergraduate Courses”, University Grants Commission, Universities Press India Pvt. Ltd., Hyderabad, 2005.
2. Amubha Kaushik, and Kaushik C.P., “Environmental Science and Engineering”, 4th Multicolour Edition, New Age International Pvt. Ltd., New Delhi, 2014.
3. Garg S.K. and Garg R., “Ecological and Environmental Studies”, Khanna Publishers, Delhi, 2006.

Course Outcomes:

On completion of the course the students will be able to

- gain knowledge on natural resources and resource conservation
- understand the ecological balance and biodiversity of ecosystem
- familiarize the methods in waste water treatment
- realize the need for environmental ethics
- know the issues in human population and to attain sustainability

Pre-requisites: Java Programming

UNIT – I 9

Understanding Components, Interfaces and Reentrance: Component - Terms and Concepts - Standardization and Normalization - Components, Interfaces and Reentrance: Components and Interfaces - Contract - Dress Code - Callbacks and Contracts - Examples of Callbacks and Contracts.

UNIT – II 9

CORBA, CCM, OMA and MDA: Object Request Broker- Common Object Service Specifications- CORBA Component Model- CORBA Compliant Implementations- CORBA Facilities- Application Objects- CORBA, UML, XML and MDA.

UNIT – III 9

Java and Java Beans: Overview and History of Java Component Technologies- Java Language- JavaBeans- Basic Java Services.

UNIT – IV 9

EJB, Java 2 Editions and COM: EJB and Java 2 Editions: Component Variety- Advanced Java Services- Interfaces versus Classes- JXTA and Jini – COM: First Fundamental Wiring Model - COM Object Reuse- Interfaces and Polymorphism- COM Object Creation and Library- Initializing Objects, Persistence, Structured Storage, Monikers- COM to Distributed COM - Meta Information and Automation - COM Services.

UNIT – V 9

OLE/ActiveX, COM+ and .NET CLR: Compound Documents and OLE- Contextual Composition and Services - .Net Framework – Assemblies the .Net Components – Common Language Frameworks.

TOTAL : 45

TEXT BOOKS:

1. Szyperski Clemens, Gruntz Dominik and Murer Stephan, “Component Software Beyond Object-Oriented Programming”, 2nd Edition, Pearson Education, New Delhi, 2011.

REFERENCE BOOKS:

1. Hortsamann S. Cay and Gary Cornell, “Core Java Volume II Advanced Features”, 9th Edition, Prentice Hall, 2013.
2. Mowbray J. Thomas and Ruh A. William, “Inside CORBA Distributed Object Standards and Applications”, Pearson Education, 2006.
3. Sadasivam G. Sudha, “Component Based Technology”, Wiley India, New Delhi 2008.

Course Outcomes:

On completion of the course the students will be able to

- understand fundamental properties of components, architecture and middleware
- write java code to develop components
- explore different software components and their applications
- gain knowledge on CORBA and .Net components
- recognize component frameworks, assemblies and object linking

Pre-requisites: Computer Networks

UNIT – I 9

Introduction to Security and Cryptography Techniques: Introduction - The Need for Security - Security Approaches - Principles of Security - Types of Attacks - Cryptography Techniques: Introduction - Plain Text and Cipher Text - Substitution Techniques - Transposition Techniques - Encryption and Decryption - Symmetric and Asymmetric Key Cryptography – Steganography - Key Range and Key Size - Possible Types of Attacks.

UNIT – II 9

Symmetric Key Cryptographic Algorithms: Introduction - Algorithm Types and Modes - Overview of Symmetric Key Cryptography - Data Encryption Standard (DES) - International Data Encryption Algorithm (IDEA) - RC4 - RC5 – Blowfish - Advanced Encryption Standard (AES).

UNIT – III 9

Asymmetric Key Cryptography Algorithms: Introduction - History – Overview - RSA Algorithm - ElGamal Cryptography - Symmetric and Asymmetric Key Cryptography - Digital Signatures - Knapsack Algorithm - ElGamal Digital Signature - Attacks on Digital Signature - Problems with the Public Key Exchange.

UNIT – IV 9

User Authentication Mechanism: Introduction - Authentication Basics – Passwords - Authentication Tokens - Certificate Based Authentication - Biometric Authentication – Kerberos - Key Distribution Center(KDC) - Security Handshake Pitfalls - Single Sign On (SSO) Approaches - Attacks on Authentication Schemes.

UNIT – V 9

Network Security, Firewalls and Virtual Private Networks: Introduction - TCP/IP – Firewalls - IP Security - Virtual Private Networks (VPN) - Intrusion.

TOTAL: 45

TEXT BOOKS:

1. Kahate Atul, “Cryptography and Network Security”, 3rd Edition, McGraw Hill Education (India) Pvt. Ltd., 2014.

REFERENCE BOOKS:

1. Stallings William, “Cryptography and Network Security - Principles and Practice”, 6th Edition, Pearson Education, 2014.
2. Jain V.K., “Cryptography and Network Security”, 1st Edition, Khanna Book Publishing Company Pvt. Ltd., 2011.
3. Convery Sean, “Network Security Architectures”, 1st Edition, Pearson Education, 2011.

Course Outcomes:

On completion of the course the students will be able to

- compare the various cryptographic algorithms
- apply the basic security algorithms required for user applications
- predict the vulnerabilities across the computing systems
- analyze the different classical encryption techniques
- categorize authentication mechanisms